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THE COMMERCIAL CAR JOURNAL

Entered as Second-Class Matter at the Post Office at Philadelphia, Pa.

REPUBLIC FOR SERVICE
REPUBLIC MOTOR TRUCK CO.
ALMA, MICH.

The Honest Truck at an Honest Price

THE DEALER RESPONSE to our November Announcement of the new **Republic** model was enormous. Personal calls, wires and mail in volume was the result. We closed territory with live, energetic dealers who readily saw the tremendous sales possibilities in the three **Republic** models.

1500 Pounds Capacity	2000 Pounds Capacity	3000 Pounds Capacity
$995.00	**$1350.00**	**$1475.00**

The Recognized Standard in Motor Trucks of this Capacity

We are ready for 1915. Are you? We predict that 1915 will be the banner year for truck sales, and especially for trucks of the REPUBLIC type and capacity. Only by quantity production can we place the attractive price on each REPUBLIC model—*the new and correct price value of motor trucks of this rating.*

There is desirable territory still open—don't hesitate in getting the REPUBLIC line for your territory. REPUBLIC dealers are money-making dealers, and if you are of that calibre, we want you.

Send now for REPUBLIC literature and get our dealer proposition. It will pay you.

Republic Motor Truck Co., Alma, Mich. U. S. A.

"The Fastest Selling Truck in America"

PUBLISHED THE 15TH OF EACH MONTH

CHILTON COMPANY

MARKET & 49TH STS. PHILADELPHIA

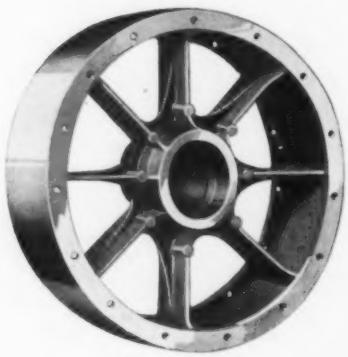
WEST'S
Cast-Steel Wheels
for Motor Trucks

"Used By America's Leading Truck Builders"

FRONT

Weight 140 lbs.

REAR



Weight 300 lbs.

THESE WHEELS SHOULD BE ON YOUR TRUCKS

There are many good, emphatic reasons why **West's Cast-Steel Wheels** should be on your trucks. Here are some of them:

They weigh less than wooden wheels designed for the same service.
They are cast in one piece and have no joints to open up or bolts and rivets to break.
They are not affected in size or form by climatic changes.
They will not warp, twist, shrink or loosen.
They stand greater load and strain than wooden wheels.
They have greater durability than any others.
They assure perfect tire fit and reduce tire bills.
They are more economical of power.
They are most dependable in service.
They are less clumsy and troublesome than wooden wheels.

West Cast-Steel Wheels are tried and proved, built to stand abuse and hard service—the product of practical and experienced engineers. Nearly 7000 are on trucks today, giving the utmost satisfaction. They will prove their value to you. Write for complete information.

SEE OUR EXHIBIT AT NEW YORK SHOW

The West Steel Castings Company

805-815 E. 70th St., Cleveland, Ohio

THE PUBLISHERS' PERSONAL PAGE

Economy is a Great Revenue

The small delivery vehicle, the economy car, is destined during the coming year to make itself felt in the delivery field. At last both the manufacturer and the owner recognize the heretofore shortcoming of the business; namely, the lack of small capacity reliable and efficient delivery cars.

Small Car Field Recognized

Our continuous efforts to bring the industry to a realization of this one vitally weak point have at last brought results, and our pioneer work in behalf of the small delivery vehicle is now being rewarded by action on the part of the manufacturers.

Our Efforts Bringing Results

We have received letters from several of the largest manufacturers concerning the advisability of concentrating on vehicles of this type. Several are now working on new models and some of the light pleasure car makers have shown their recognition of the demand by placing commercial bodies on their product. There is every indication that 1915 will see small cars of excellent design and construction, and with consequent road ability and wearing qualities, placed on the American market in considerable numbers. It is recognized that this is a quantity-production proposition, and that the cars must be sold at a very low figure.

Manufacturers Planning Outputs

The large number of converted cars, the success of the pioneer vehicle of this kind, together with the fact that manufacturers are now investigating average load conditions in the delivery field, have shown the great demand there is for such cars. We are confident in predicting a tremendous increase in their number for the coming season. This being the case, we are optimistic as to the future and look forward to the greatest production year of the commercial car industry.

1915 Greatest Production Year

The CCJ is the only truck journal a member of the Audit Bureau of Circulation—Why?

The Autocar

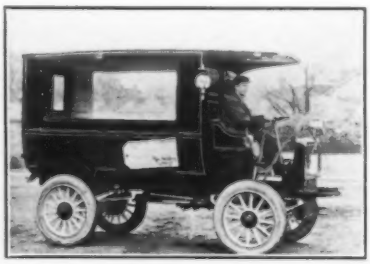
"Used in Every Line of Business"

A Business Builder for Florists

ABILITY to cover wide delivery territory quickly means much to the florist's business. The *Autocar*, running 50 to 100 miles daily, doing the work of 4 to 6 horses, at a *lower operating cost* than horse equipment, has proved itself the ideal florist's delivery vehicle.

Penn, The Florist, 37-43 Bromfield St., Boston, says, under date of October 10, 1914: "You will be interested in knowing that we expect to order a third *Autocar* in the near future.

"We have operated our two *Autocars* for more than two years with the most satisfactory results. They have given us no trouble to speak of and their value to our business has gone beyond our expectations. For general delivery purposes, they have been most practical and economical."



Max Schling, New York

H. H. Battles, Philadelphia

The *Autocar* is the product of seventeen years' concentration on the manufacture of one model of motor delivery vehicle. It has been adopted by 1800 concerns, many of whom own from 10 to 270 cars each.

Hoffman, Boston

Chassis Price $1850

Why not become fully informed on the *Autocar's* value for delivery purposes? Write for our new catalog. It will show you the way to lower delivery costs and improved delivery service. Address Dept. J.

George Wittbold, Chicago

THE AUTOCAR COMPANY, ARDMORE, PA.

Established 1897 **Motor Delivery Car Specialists**

The Commercial Car Journal

VOLUME VIII | PHILADELPHIA, DECEMBER 15, 1914 | NUMBER 4

LOW COST OF ZOLINE NOT ESTABLISHED—NEW FUEL MAY BE MORE EXPENSIVE THAN GASOLINE

Diligent inquiry into the current stories of the new fuel Zoline, which it is claimed can be made for 1½ cents per gallon, brings the following letter from C. G. Fisher, who is as close to Mr. Andrus, the inventor, as anyone:

To the Editor:

We have made a great many experiments, and up to the present time these have not been satisfactory in regard to cost, or in the general manufacture of the fuel. We are interested, of course, in assisting any inventor who may have a new fuel which will give benefit to the automobile, but the closer we get down to facts in this particular fuel, the more we are inclined to believe that it is even more expensive than gasoline—the entire plan does not seem to be practical.

As you know, none of the people connected with this outfit would, for a minute, have anything to do with an article that was not exactly as represented, and we are not responsible for the large amount of publicity that has gotten into print.

There are some points about the new fuel that, even at this time, we cannot explain, but our experiments within the next day or two will settle beyond question all of these points that are now bothering us.

Yours very truly,
C. G. FISHER.

This would indicate that the fuel is not yet in a position to revolutionize the automobile industry, as was at first announced.

We also have a letter from Howard Marmon, in which he says:

"This matter is in hardly such shape yet that anything can be said about it. So far, it has been a secret process that has been carefully guarded. The only fact so far available is that they furnish a fuel, from a little experimental factory. This fuel has very much the same characteristics as gasoline, but how they make it, or whether they really do, is a matter that has not yet been verified."

"What Andrus really did was to take kerosene, and by some means with which I am not familiar or do not understand, would step it up from a reading of 40 degrees on the Baume scale to a reading of about 65. The naphthaline he used, he succeeded in liquefying and keeping liquified at low temperatures, and by taking advantage of the affinity naphthaline seems to have for water under certain conditions, would finally wind up with a highly volatile fluid that carried in suspension 30 to 40 per cent. of water. The action of this fuel in a car was quite remarkable. It would start more readily than gasoline; would propel a car farther on a gallon; and add very materially to the acceleration abilities of the car. It would also clean out a dirty motor by removing the carbon. The fact that water properly injected into the combustion chamber of a motor along with gasoline or kerosene results in greater power and a cleaner motor is well known. This result Andrus accomplished by carrying the water uniformly distributed in the fuel. However, as before stated, it was found to be too expensive a process to be of any particular benefit."

The latest news of Zoline is a letter from Chester S. Ricker, engineer of the Speedway, who says: "Looking over the results of a test of Zoline taken from same supply that was used during the Marmon test, I find that it contained 72 per cent. gasoline, or something that distilled off at exactly the same temperature, acted like it, had the same gravity and smelled similarly. The remainder and the residue—28 per cent.—was largely naphthaline. C. G. Fisher has given it up completely."

This looks as though the real composition of the fuel is gasoline, and would place the matter in the light of a pure fake.

Table of Contents

	PAGE
Advertisers' Index	95
Accessories and Appliances	28
Auto Line Basis of Railway Traffic Increase—By Frank H. Reed	36
Bushings: The Important Part They Play in the Cost of Operating and Maintaining Motor Trucks—By John W. Watson	48
'Bus Line For Philadelphia	35
Cartoon of Sales Managers	16
Comfort of the Driver—By Murray Fahnestock	40
Commerce Supplants Friction With Shaft Drive and Sliding Gears	25
Conventions of Interest to the Trade	6
Editorials	7
Electrical Department	51
Foreign News—From Across the Water	20
Formula for Estimating Motor Truck Operating Costs	38
Future of Truck Business in the Middle West—By W. D. Meng	41
Influence of the Pioneer Spirit on Electric Vehicle Progress	51
Motor Trucks With and Without Trailers, Horse Power, Gears and Road Resistance of, —By H. Kerr Thomas	43
Personal Items	5, 6
Republic Three-Quarter Ton Truck	23
Saxon Brings Out a Delivery Car	24
Successful Truck Selling—By Richard Wright	9
Trailers, Use of, Increasing	12
Trucks in Intercity Work—By C. T. Barrett	22
What it Costs to Keep a Horse	42
What Some Successful Denver Dealers Think—By Charles M. Smyth	11
War Notes	20

COMING AUTOMOBILE SHOWS AT WHICH COMMERCIAL CARS WILL BE EXHIBITED

January—Tiffin, Ohio. Auditorium.
January 9-16—Milwaukee, Wis. Auditorium. Milwaukee Auto Dealers' Association. Bart J. Ruddle, Manager, 71 Sentinel Building.
January 16-23—Cleveland, Ohio. Wigmore Coliseum. Cleveland Automobile Show Company. Fred. H. Caley, Manager, Hollenden Hotel.
January 18-23—Rochester, N. Y. Rochester Auto Trades' Association. E. M. Alling, Secretary.
January 19-23—Baltimore, Md. Fifth Regiment Armory. Auto Dealers' Association and Auto Club of Maryland. H. M. Luzius, Manager, 12 W. Mt. Royal Avenue.
January 30-February 6—Minneapolis, Minn. Armory. Minneapolis Automobile Trade Association. R. B. Simming, Secretary, 707 Andrus Building.
February—Louisville, Ky. Louisville Auto Dealers' Association. P. S. Longest, Secretary, 725 South Third Street.
February—Elmira, N. Y. State Armory. Elmira Auto Club. Frank D. Pratt, Manager, 210 East Water Street.
February—Grand Forks, N. D. Auditorium. Grand Forks Auto Show Association. L. Stinson, Manager.
February 1-7—St. Joseph, Mo. Auditorium. St. Joseph Automobile Show Association. R. R. Calkins, Manager. German-American Bank Building.
February 8-14—Kansas City, Mo. Convention Hall. Kansas City Motor Car Dealers' Association. E. E. Peake, Secretary, 909 Gloyd Building.
February 15-20—Omaha, Neb. Auditorium. Omaha Auto Show Association. C. G. Powell, Manager, 2119 Farnum Street.
February 15-21—Grand Rapids, Mich. Klingman Furniture Building, Grand Rapids Herald. A. H. Vandenberg, Editor.
March—Watertown, N. Y. Watertown Automobile Association. Arthur E. Sherwood, Manager, 4-6 Flower Building.
March 6-13—Boston, Mass. Mechanics' Building. Boston Auto Dealers' Association. Chester I. Campbell, Manager, 5 Park Square.
March 15—Cedar Rapids Ia. Auditorium. Cedar Rapids Auto Dealers' Association. Martin Beck, Manager. First Avenue, West.
April 15-20—Deadwood, S. D. Deadwood Business Club. George H. Kilker, Manager.

Reading Terminal Market, Philadelphia, Pa., will soon deliver market purchases to customers at a distance of 18 miles. A fleet of motor trucks has been obtained by the Reading Terminal Market Business Men's Association, which has formed a stock company to organize and conduct the new system of delivery, to be conducted on the same plans as department store deliveries. The market baskets will be delivered direct to the doors of the customers. Heretofore they have been carried at a reduced rate by the railroads.

Three hundred Ford chasses have been fitted with ambulance bodies and are being used by the British army, according to an English newspaper. These wagons carry two regulation stretchers with driver and attendant. They can carry within wounded men who may be able to sit up; these are amply protected from the weather. They are being driven by employes of the English branch of the Ford Motor Company. Many of these ambulances were bought by individuals and presented to the government.

The CCJ has most readers because it gives most information

S. A. E. STANDARDS COMMITTEE CONVENTION

AT the meeting of the Standards Committee of the S. A. E. held in November, reports were submitted by twelve Divisions of the committee at its three afternoon sessions. As was expected, the reports consisted largely of statements of the manner in which the various subjects under consideration are being approached and the results of the subcommittee deliberations to date, the purpose being to disseminate widely among the members information as to the progress being made in the matter of recommending standards and practices.

The subcommittee on Speed and Mileage Ratings made a report which, after very extensive discussion, was adopted by the Division for submission to the Standards Committee for acceptance, as follows:

Electric Vehicle Speed Ratings shall be based on continuous operation with half load over hard, smooth and level roads or pavements at the actual average battery voltage.

Electric Vehicle Mileage Ratings shall be based on the rated five-hour discharge capacity of the battery and a continuous run with half load over hard, smooth and level roads or pavements.

These recommendations were approved by the Standards Committee.

Program of January Meeting

January 5—9 A. M.—Meeting of Standards Committee (S. A. E. rooms). 8 P. M.—Meeting of Governing Committees of Sections and meeting of Council (S. A. E. rooms).

January 6—10 A. M.—Business Session (Engineerin Societies Building). Report of Ball and Roller Bearings Division; report of Carburetor Fittings Division. 1 P. M.—Recording Devices for Commercial Cars; report of Truck Standards Division; report of Commercial Car Wheels Division; report of Electric Vehicle Division. 6.30 P. M.—Informal Dinner (Engineers' Club). 8 P. M.—(Engineering Societies Building) Pros and Cons of Correct Tire Inflation, C. B. Whittelsey; report of Pleasure Car Wheels Division; Wire Wheels vs. Wood Wheels; Mudge and Houk; report of Lock Washer Division; report of Miscellaneous Division.

January 7—10 A. M.—Professional Session (Engineering Societies Building); report of Electrical Equipment Division; Railway Gasoline Locomotives, Ehle, Railway Motor Cars, Chatain, Warning Signals, McMurtry; report of Research Division. 1 P. M.—Malleable Iron Castings, Moldenke; report of Frame Sections Division; report of Iron and Steel Division; Nomenclature of Car Parts, Allowances for Piston Fits, Myers; Worm Gears, Myers. 6.30 P. M.—Informal Dinner (Engineers' Club). 8 P. M.—Automobile Engineering Curricula, Fishleigh; Motor Car Testing, Browne; report of Springs Division; report of Standards Exchange Division; European Situation as Affecting America, Clayden.

OPPORTUNITY FOR AMERICAN AUTOMOBILE MANUFACTURERS TO GAIN EUROPEAN TRADE, AS VIEWED BY ONE OF OUR FOREIGN READERS

TO THE EDITOR:

Being a subscriber to your publication and interested in your war editorials, I take the liberty to give you some useful information which you may use as you like.

There is no doubt that the opportunity presented to the American industries through the huge conflict now involving the whole of Europe is unprecedented, but I doubt if the American manufacturers will size up this opportunity and establish themselves in Europe on a sound lasting basis, but will satisfy themselves simply to fill out a certain lapse of time which Europe will need after the war to reorganize and resume business on a larger scale than ever before.

As a matter of fact, the American business man is applying to his exports to Europe the same terms as he does in shipping goods to some small islands or to some remote place on this planet.

The European export business to the contrary is generally done on a much broader basis, and it seems to a European merchant rather pretentious to be mistrusted so much by the American.

The Germans set the best example how to conquer the export trade. They prepared exactly what each country required. Germany never sent goods abroad priced in "marks." The Germans are giving long credits and with very much success established their price lists f. o. b. destination.

The English are aware of the great opportunities for export trade extensions, and are very much inclined to adopt German methods in order to conquer and to maintain the new trade. The English Government and the leading banks are encouraging the exporters in this direction to a great extent. As a result every English manufacturer is making preparations beforehand in order to be ready to supply large quantities after hostilities will have ceased. All the large factories (especially those constructing cars and those making auto parts or accessories) are working in day and night shifts on all kinds of orders from the English and French Governments, and in order to get these orders out are enlarging their plants, training more workmen, etc.

After hostilities will cease the nations involved in this war will need some time to readjust their financial situation before placing large orders, and during this period the large factories will be relieved from the orders for war purposes and will use their large plants and sufficient skilled labor in manufacturing and producing any amount of required goods.

The splendid stand of the English in this international struggle will make their products a "standard" in the allied countries, and, favored by the transportation facilities in every respect to every European country, their export, especially to Europe, will be enormous.

Under these conditions it will be wise to remind the American manufacturer that while the prospects of selling American made cars, trucks and accessories to Europe in the near future are very bright, he should not forget that the English competitor looms up big on the horizon. He will have to depart from his habit of imposing his terms on the foreign trade, and should accommodate a large foreign consumer the same as he is doing his domestic customer. This way he would create for him a very large field in Europe, and in all probability there will never again be presented to the American manufacturer such a good opportunity as just now. However, it must be recommended that when the demand does come it will be too late to set about supplying goods. Now is the time to get in line.

B. PODIEBRAD.

Paris and London, S. W.

EDISON PLANT TO BE REBUILT AT ONCE

Starting in the testing room of the film plant at about 5 p.m., on December 9th, fire swept through the West Orange, N. J., factory of Thomas A. Edison, causing a loss of $7,000,000, according to Edison's own estimate, while there was $2,000,000 insurance. The storage battery plants were not harmed, and over half of the total number of employees will not be affected by the blaze, although it is estimated that 3000 people will be out of work. Mr. Edison intends to rebuild at once.

NEW YORK CITY DISPLAYS ITS MOTOR STREET CLEANERS

Sixteen motor trucks, thirteen equipped with different types of street-cleaning appurtenances and three chasses without bodies, were exhibited during the past month at the show of the New York City Street Cleaning Department held at the Twenty-second Regiment Armory.

Trucks of eleven different manufacturers were shown. Of these, four were G. V. electrics, two were Lansden electrics, and two were Jefferys, one a standard one and a half tonner and the other a four-wheel-driven model. One each of the following trucks were shown: Reo, Packard, White, Garford, C. T., Ward, Knox and Couple-Gear.

Motor-Driven Street-Cleaning Apparatus Which Took Part in New York Parade

Personal Items

R. W. Knowles is assistant engineer of motor vehicle department of Milburn Wagon Company, of Toledo.

W. Robinson, formerly editor of "La Presse," a Montreal newspaper, has joined the Wagenhals Motor Car Company, Detroit, Mich.

Frederick J. Fisher has been made secretary of the Standard Motor Truck Company, Detroit, succeeding W. K. Ackerman, resigned.

Joseph A. Anglada, in addition to his other duties, has become consulting engineer for the Nott Fire Engine Company, Minneapolis, Minn.

Chas. Smith, formerly with Newark, Ohio, Lumber Company, resigned to accept position with Blair Motor Truck Company, as general manager.

Urban A. Fisher, son of Albert A. Fisher, president of the Standard Motor Truck Company, Detroit, has been elected vice-president of the company.

C. B. Rose, chief engineer of the Velie Motor Vehicle Company, is now at the Hotel Cecil, London, England, investigating the truck industry in army circles.

Clark E. Cotton, formerly with the Hayes Manufacturing Company, now sales manager of Schleider Manufacturing Company, Detroit, manufacturer of motor valves.

R. W. Bush, formerly with Kurzman Plow Company, Peoria, Ill., has succeeded Mr. Giltner as sales manager of the Velie Motor Vehicle Company, Moline, Ill.

Maurice L. Kerr, formerly assistant engineer of Crown Commercial Car Company, Milwaukee, Wis., joined engineering staff of Dart Motor Truck Company, Waterloo, Iowa.

L. M. Bourne, formerly assistant production manager of Goodyear Tire & Rubber Company, has become factory manager of the Double Fabric Tire Company, Auburn, Ind.

A. Pigman, formerly with Garford Company, New York City, is now sales manager of the Indiana Truck Company, Marion, Ind., with offices at 250 W. 54th Street, New York City.

F. R. Humpage, formerly connected with Packard Motor Car Company and the E. R. Thomas Motor Company, is now general manager of the Dyneto Electric Company, Syracuse, N. Y.

Stephen O. DeOrlow, formerly experimental engineer and designer for Packard Motor Car Company, has joined the engineering staff of the International Harvester Corporation, Akron, Ohio.

C. H. Gleason, who for 7 years has held a responsible position in the sales department of the Sheldon Axle Company, has joined the sales and designing department of the Kalamazoo Spring & Axle Company, Kalamazoo, Mich.

Finley R. Porter, formerly chief engineer of the Mercer Automobile Company, Trenton, N. J., has organized the Finley Robertson Porter Company, and has taken over the plant of the Metropole Motor Car Company, at Port Jefferson, L. I., in which to build chasses to sell at $5000 with full electric equipment.

John N. Lansden wishes to announce that he is in no way connected with the newly incorporated Lansden Company, Inc., which has bought out the business of the old Lansden Company, in New Jersey, and making the Lansden electric trucks. He has established headquarters at 1790 Broadway, where he is working on a project that is under way, but has not yet announced the organization of his company.

Changes and Factory News

Blair Motor Truck Company, Newark, Ohio, erecting factory on 16th Street.

Service Motor Car Company, Wabash, Ind., changed name to Service Motor Truck Company.

Willys-Overland Company will manufacture at the Gramm plant in Lima Ohio, only 1350-lb. delivery wagons.

Standard Tire & Rubber Manufacturing Company, Willoughby, Ohio, will erect steel factory addition costing $25,000.

Atwater Kent Manufacturing Company, 4937 Stenton Avenue, Philadelphia, Pa., is erecting a one-story addition to its factory.

Maher Manufacturing Company, Libertyville, Ill., is to establish a plant for the manufacture of lighting fixtures and automobile accessories.

V-Ray Company, Marshalltown, Iowa, has moved its New York City office from Fifth Avenue and Forty-second Street, to 105 West Thirty-eighth Street.

Durant-Dort Carriage Company, Flint, Mich., has changed the chassis price of its 2000-lb. Flint model to $1190 with solid tires and $1275 with pneumatics.

Central Foundry Company, 705-23 Park Street, Milwaukee, Wis., has established a department for the production of pistons, piston rings and cylinder castings.

Linde Air Products Company, New York City, has opened a warehouse at 104 N. 5th Street, Portland, Ore., for the convenience of users of oxygen in the Northwest.

Sandow Truck Company, 3751-55 Wentworth Avenue, Chicago, Ill., has acquired large two-story building at 2916-20 W. Lake Street, retaining present place as Factory 2.

Chester County Motor Company, Coatesville, Pa., increased its capital stock to $500,000, and plans the erection of a factory to manufacture commercial trucks.

Kelsey Wheel Company, Memphis, Tenn., will enlarge plant to permit building of entire wheel frames for automobiles, instead of spokes only. $100,000.

Weller & Thomas have plans for two-story motor truck factory, 100x190 ft., at Columbus, Ohio. J. A. Thomas, 287 Dryden Avenue, Zanesville, Ohio, can furnish particulars.

Booth, N. E., New York City, has been taken over by the Booth Felt Company. The officers are: N. E. Booth, president; E. W. Booth, vice-president, and R. H. Beards, secretary and treasurer.

Commercial Automobile Body Company has opened offices and salesrooms in St. Louis, Mo. Hugh Cartwright, for 17 years vice-president of the Banner Buggy Company, is president and general manager.

Homer Motors Company, Los Angeles, Cal., will erect a factory with a capacity for manufacturing twenty-four motor trucks per month. It is the intention of the company to manufacture all parts in Los Angeles.

Koehler, H. J., Sporting Goods Company, has moved its offices and general headquarters from Broadway and Fifty-fourth Street, New York City, to 291 Halsey Street, Newark, N. J., in close proximity with the factory.

Eisemann Magneto Company, Brooklyn, N. Y., has been compelled to add 15,000 sq. ft. of manufacturing space to its factory, and is working a double shift of men. This overtime work is expected to continue for the next 5 or 6 months.

The Motokart Company, Inc., Scranton, Pa., has been financed by the Scranton Industrial Development Company and the Traders National Bank of Scranton, and plans are now being drawn for the erecting of three two-story building, 60x368 ft.

Hindley Gear Company, Philadelphia, Pa., has bought out the Universal Screw Company, also of Philadelphia, manufacturer of worm threads and long threads, and will, in future, cut worms and screws for the trade, in addition to the Hindley worm complete.

Hoover Steel Ball Company, Ann Arbor, Mich., has heretofore exported steel balls from Germany to the amount of from $200,000 to $300,000 annually, but has decided to manufacture a line of fine balls, inasmuch as the importation from Germany has been stopped by the war.

New Jersey Traffic Commission at a recent meeting held in Trenton, launched a movement to adopt uniform traffic regulations in various cities and states. These plans were presented to the New Jersey Traffic Commission by F. H. Elliott, general secretary of the Safety First Society, in New York.

Best-Lite Company, Newton, Iowa, has changed its name to the Xcel-O-Lyte Company for the following reason: When it originated its trademark, it was unaware that at that time the name Best Light Company was a copyrighted name, and as this fact has been discovered, the name of the company has been changed.

Legal Items

Rushmore Dynamo Works, Plainfield, N. J., announces that it has won its suit against the Badger Brass Manufacturing Company, which has been ordered by the United States Court of Appeals to give an accounting of profits and damages for infringing Rushmore lamp designs.

The G. Piel Company now has a suit pending in the United States District Court, at Brooklyn, against the Automobile Supply Company, manufacturers of the Handphone, for infringement of eight separate claims of the Long patent. A suit has also just been filed by the Piel Company against the Stewart-Warner Speedometer Corporation, for infringement of ten of the fourteen claims of the Long patent, by reason of the sale of the Stewart warning signal, and a motion for a preliminary injunction has been made which will be argued in the near future.

The Splitdorf Electrical Company, Newark, N. J., has filed suit against the Bosch Magneto Company, claiming that the defendant company has been manufacturing and selling a type of magneto that the Splitdorf people consider an infringement on its patent rights. The usual accounting, damages and injunctions are asked. The patent in question is one that has not, so far, appeared in magneto litigation, and was issued on September 30, 1913, to John M. Dinkins, Franklin B. Hays and William L. Taylor, under number of 1,074,416. This patent was transferred on July 10th by the patentees to the Splitdorf Electrical Company, who is now sole owner of all rights appertaining thereto.

The Bosch Magneto Company, New York City, answer to bill of complaint filed against it, denying infringement and averring that the patent in suit is not valid. It further denies that it infringes or threatens to infringe said patent, and that it has received no gains by any infringements of the patent or that it has caused the plaintiff any damage; and further claims that the inventors of the patent were not inventors of any material part of the thing patented, but that every part thereof was in use prior to the alleged invention, or more than 2 years previous to the application for patent.

The CCJ leads in circulation, advertising and prestige

Personal Items—Retail

Lemon Greenwald, Ashland, Ohio, has become manager of Santiago, Porto Rico, branch of Firestone Tire & Rubber Company.

C. W. Brown, formerly with Firestone Tire & Rubber Company's San Francisco branch, now manager of same company's Seattle branch.

Z. F. Harshberger has been appointed Indiana manager of the H. W. Johns-Manville Company, with headquarters in Indianapolis.

Winfield F. Jewell, a pioneer in the automobile industry, has been appointed retail sales manager of the New York branch of the Studebaker Corporation.

W. E. Kenyon, Pacific coast sales manager of the Commerce Motor Car Company, Detroit, has resigned. He will become associated with another company on the coast.

Jos. A. Hussion, formerly with the Knox Motors Company, Springfield, Mass., has joined the sales department of the General Vehicle Company, Incorporated, Long Island City, N. Y.

H. L. Bolden, formerly sales manager for a Detroit company, will, on January 1st, become sales manager for the Chase Motor Company, Syracuse, N. Y. He will have charge of all advertising.

C. W. Heintz, for the past 5 years connected with the New York office of the Republic Rubber Company, Youngstown, Ohio, has become manager of the Buffalo branch, succeeding B. F. Morris, resigned.

C. D. Studebaker has become manager of the New York branch of Firestone Tire & Rubber Company, succeeding J. J. Jordan, who goes to Europe to take charge of the Firestone Company's European department.

Fred H. Cozzens, formerly with International Motors Company, New York, and Peerless Motor Car Company, Cleveland, now eastern and foreign manager for the Four-Wheel Drive Company, Clintonville, Wis.

R. C. Bridge, formerly district manager of the Studebaker Corporation, has become manager of Salt Lake City branch of same company. He has charge of retail sales of Studebaker Corporation of Utah, as well as wholesale business of the parent company.

William F. Bauer has become manager of the Chicago office of the Edison Storage Battery Company, succeeding Charles B. Frayer, resigned. Mr. Bauer has been with the Edison Company for about a year in the railway department acting as assistant manager.

STEGEMAN REDUCES PRICES AND CHANGES LOAD RATINGS

The Stegman Motor Car Company, Milwaukee, Wis., has informed us that the prices of Stegman trucks as published in our November issue have been reduced, and the capacity ratings changed. In order to make the matter quite clear, we give the old prices and ratings and the new:

Old Prices and Ratings	
1500-lb. chassis	$1600
2000-lb. chassis	2250
4000-lb. chassis	2950
6000-lb. chassis	3500
8000-lb. chassis	3950
New Prices and Ratings	
1500-lb. chassis	$1600
3000-lb. chassis	2100
5000-lb. chassis	2800
7000-lb. chassis	3350
10000-lb. chassis	4200

The trucks are also provided with taper roller bearings in place of ball bearings. Enclosed chains in the above models can be had for $150 extra.

New Agencies and Changes

Lonwell Auto Truck & Sales Company, El Paso, Texas, changed name to El Paso Overland Auto Company.

Colonial Motor Car Co., Maxwell distributor in St. Louis, Mo., has agency for Kissel pleasure cars and trucks.

Moritz-Mullin Company, 344 Jefferson Avenue, Detroit, Mich., has become State distributor for Signal motor trucks.

Studebaker Corporation, New York City, has leased building Broadway and Fifty-fifth Streets, for service station and salesroom.

Hughson & Merton, Inc., manufacturers' representatives, Los Angeles, Cal., have taken the agency for the Bull tractor on the Pacific coast.

Remy Electric Company has changed its service station in Los Angeles, Cal., and the station is now conducted by the Hucks Auto Electric Company, 627 West Pico Street.

Motor Sales Dept. of Buchanan-Daley Co., Joliet, Ill., in charge of R. C. Hanna, has located on Benton Street, and will handle Hudson and Allen cars and General Motor Company's delivery cars.

Eveland Engineering and Manufacturing Company, Philadelphia, Pa., has secured the exclusive sales agency and manufacturing rights of the Mesco Rotary Valve Motor. George L. Weber has been appointed sales manager.

Best Service Truck Company, 1112-20 N. 12th Street, St. Louis, Mo., which was reported in our last issue to have been incorporated for the manufacture of motor trucks, will not manufacture trucks, but has taken the agency for the Vulcan, made by the Driggs-Seabury Ordnance Corporation, Sharon, Pa., and the Signal, made by the Signal Motor Car Company, Detroit, Mich.

New Incorporations

Eclipse Manufacturing Company, Indianapolis, Ind., has been organized with a capitalization of $50,000 for the purpose of manufacturing spark plugs and motor accessories.

Davis-Fry Manufacturing Company, Oakland, Cal., has commenced the manufacture of pneumatic and solid tires under the brand name of Hercules. The Hercules tread has fabric on the edge which is said to reduce skidding and to increase the durability of the tire.

Armored Motor Car Corporation, New York City, has been formed for the purpose of turning out armored motor cars mounting two machine guns in revolving turrets. Capital, $6000. The steel bodies will be built on contract and will be mounted on a two-ton Federal chassis.

Koehler agencies have been opened with the following concerns: Capitol Motor Car Company, Providence, R. I.; Dix Auto Company, Cape May Court House, N. J.; Thos. Peppler & Son, Hightstown, N. J.; H. J. Wagner, Houtzdale, Pa.; Anderson & Ivey, Albany, Ga.; W. L. Brown, Dotham, Ala.; Struber's Garage Louisville, Ky.; Union Motor Car Company, Lexington, Ky.

Kiel & Evans, Oakland, Cal., have a clever scheme for insuring an equal amount of service to all buyers of motor trucks. They give their customers a service coupon book worth fifty dollars in free service with the purchase of each truck. When any repair is made, the owner simply gives the repairman a coupon out of the book to the amount of the work done.

Conventions of Interest to the Trade

The list of conventions given herewith is published each month, so that commercial car manufacturers can communicate with the proper authorities, with the idea of arranging to give lectures, illustrated talks, statistics, etc., to show the advantage of motor trucks in these various lines; also, possibly, to show and demonstrate their cars.

National Conventions

January 16-19—at New York City. National Association of Piano Dealers of America, Executive Board of Control. Hotel Astor. Percy S. Foster, Foster Building, 1330 G Street, Washington, D. C., Secretary.

March 1-15—at Mason City, Iowa. National Creamery Buttermakers' Association. M. H. Meyer, 1011 West Washington Avenue, Madison, Wis., Secretary.

State Conventions and Fairs

December 28-30—at Chicago, Ill. American Society of Agricultural Engineers. F. M. White, of Madison, Wis., is Secretary.

January 12-15—at Chicago, Ill. Retail Hardware Dealers' Convention. L. D. Nish, of Elgin, Ill., is Secretary.

January 19-21—at Fargo, N. D. Tri-State Grain Growers' Association. Address Commercial Club.

January 20-22—at Spokane, Wash. Retail Hardware Dealers' Association.

January 26-28—at Waco, Tex. Retail Hardware Association Convention. Henry Mart, of Dallas, Secretary.

January 26-29—at Portland, Ore. Retail Hardware Dealers' Association.

January 26-29—at Indianapolis, Ind. Retail Hardware Association. M. I. Corey, of Argos, Secretary.

February 3-5—at Milwaukee, Wis. Retail Hardware Dealers' Association.

February 9-12—at Omaha, Neb. Nebraska Retail Hardware Association. Nathan Roberts, of Lincoln, Neb., Secretary.

February 9-12—at Saginaw, Mich. Retail Hardware Association Convention and Exhibit will be held in Auditorium. A. J. Scott, of Marine City, Mich., Secretary.

February 10-11—at Manchester, N. H. Thirtieth Annual Convention of Granite State Dairymen's Association at St. Cecelia Hall. Manchester Publicity Association is interested.

February 16-19—at Des Moines, Iowa. Retail Hardware Dealers' Association.

February 16-19—at Cincinnati, Ohio. Retail Hardware Dealers' Association State Convention. Headquarters at new Gibson Hotel. Exhibit at Music Hall. James B. Carson, of Dayton, Secretary.

February 17-18—at Pittsburgh, Pa. Retail Lumber Dealers' Association of Pennsylvania. Hotel Henry. Address Chamber of Commerce.

February 17-19—at Fargo, N. D. Annual Convention of North Dakota Hardware Association. N. C. Barnes, of Grand Forks, is Secretary.

February 19-22—at St. Louis, Mo. Retail Hardware Association and Mississippi Valley Implement and Vehicle Association Annual Convention. F. X. Beeherer, Secretary, 5136 North Broadway.

February 22-24—at Boston, Mass. New England Retail Hardware Association.

February 23-25—at Lexington, Ky. Retail Hardware and Stove Dealers' Association to convene. Headquarters are at Phoenix Hotel. J. M. Stone, of Sturgis, Ky., Secretary.

February 23-26—at St. Paul, Minn. Retail Hardware Association of Minnesota. H. O. Roberts, Metropolitan Life Building, Minneapolis, Secretary.

March 2-5—at Mitchell, S. D. Retail Hardware Dealers' Association.

March 16-18—at San Francisco, Cal. State Retail Hardware Association. Address L. R. Smith, 561 Sixteenth Street, Oakland.

May 11-13—at St. Petersburg, Fla. Retail Hardware Association. G. E. Noblit, Tarpon Springs, Secretary.

June 7—at Reading, Pa. One week. Industrial Exposition. Address Industrial Committee, Chamber of Commerce.

Firemen's Convention

July 13-15—at Petroskey, Mich. State Firemen's Association. A. P. Lane, of Ithaca, Mich., Secretary.

Elbert Motor Car Company, 2012 15th Avenue, W., Seattle, Wash., manufacturer of the Elbert cyclecar, will manufacture a light delivery car with a carrying capacity of 500 lbs.

The CCJ is the only truck journal a member of the Audit Bureau of Circulation—Why?

THE COMMERCIAL CAR JOURNAL

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The Commercial Car Journal is a Member of the Audit Bureau of Circulation

WHY ARE CARBURETORS STILL UNPROTECTED?

WHERE are conundrums connected with the design of motor-driven trucks as well as other vehicles. Here is one of them: why, when every moving part of the motor is housed in and every precaution taken to prevent the ingress of dirt, and carbonization of cylinders, why we ask, is the carburetor placed behind a fan which draws all the dirt from the road that it can possibly catch, and drives it into the intake? Of all the delicate mechanism under the hood the carburetor is practically the only thing which is still left unprotected. Is it any wonder the cylinders become fouled when the entire hood with its open front and fan forms a most efficient dust catcher, which could not, if expressly designed for the purpose, gather any more dirt and shove it into the engine than it does under present conditions.

One look under the hood of almost any truck which operates in the suburbs on dirt roads is sufficient to reveal the grit and grime which has accumulated in a short run of 8 hours. Suppose that none of the things under the hood were cleaned for months at a time. Imagine the filthy condition that would exist; yet a large percentage of the dirt which enters the enclosed compartment surrounding the engine is drawn directly into the engine month after month without any sign of a screen or any device whatever to prevent it. This isn't treating the motor right.

It can be prevented. The carburetor can be piped to draw its air from a screened compartment, or removable and easily cleaned screens of large area could be and should be provided. This is a little more work, but it would pay, saving much wear and tear on the motor, less frequent overhaulings being necessary.

TRUCK EXPORTS TO EUROPE ESTIMATED AT APPROXIMATELY $20,000,000

THE export of trucks to Europe for war purposes still continues. Every company that is shipping is under more or less obligation to the foreign powers not to divulge information concerning the number, the capacity, or to whom the trucks are being sold. For this reason there is no really authentic list of shipments to Europe. Nobody knows exactly the figures. In spite of the censorship, however, facts and figures will leak out in one way or another, and the list which we herewith publish is probably as accurate as any that has yet been compiled, but we frankly state that it is but a close approximation.

Autocar Company	**1000**
White Company	**1600**
Packard Motor Car Company	**802**
Peerless Motor Car Company, about	**300**
Pierce-Arrow Motor Car Company	**600**
Kelly-Springfield Motor Truck Company	**365**
Thomas B. Jeffery Company	**300**
Federal Motor Truck Company	**75**
Garford Company	**145**
Kissel Motor Car Company	**102**
Standard Motor Truck Company	**100**
Krebs Commercial Car Company	**400**
Chase Motor Truck Company	**50**
Reo Motor Truck Company	**150**
Knox Motors Company	**10**
Total,	**5,999**

This we can call six thousand trucks.

If we figure an average price of $3000 each, we have here an investment in trucks of $18,000,000, but that is not all. Practically all of these machines are fitted with more or less accessories and many have extra wheels and tires. Assuming that the extra wheels and tires and other equipment amount to $300 per car, we have an additional figure of $1,800,000, making a grand total of $19,800,000 thus far ordered in trucks alone from the American manufacturers. Hardly a day goes by but that in a roundabout manner we are informed of additional cars being sold.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

THE BUYERS' REVIEW ISSUES

ALTHOUGH commercial cars will be excluded from the national shows this year and no national truck show will be held, the same opportunity will again be afforded to all dealers and prospective purchasers to view all the different makes of commercial cars on the market under one cover, the same as last year, and that in the coming two issues of *The Commercial Car Journal*, and which will be known respectively as the Eastern and Western "Buyers' Information" Numbers.

The January issue will contain detailed specifications and illustrations of all trucks built in the East, while the February issue will take care of all Western makes. One of the most important points in favor of a show of this kind is that the dealer who wants to take on other lines can readily make comparisons for the reason that all specifications are arranged in tabular form, giving prices, weight, dimensions of carrying space, load, platform height, speed, horsepower, bore, stroke, number of cylinders, type of cooling and radiator, carburetor, ignition, spark plug sizes, wheelbase, etc. Both gasoline and electric trucks will be displayed. Also all models of a similar capacity will be grouped and the reviews will be followed by indexes, arranged according to name of maker, capacity, price, body style, etc.

These reviews will represent composite catalogues of practically all live truck makers in America, and will be held by the trade as a buying reference throughout the year.

In connection with the January issue we will also publish an article entitled "An Analysis of 1915 Commercial Car Specifications." In this article, all the specifications contained in Eastern and Western reviews will be carefully analyzed and averages computed, so that the trend of design in various capacity trucks can be readily ascertained.

Steel and Rubber Markets

Steel Prices Again Lower

Owing to the fact that steel sales have been disappointing as a whole, steel prices are still further reduced this month, many of the mills accepting small orders at substantial concessions with specifications against contracts for the first quarter of next year. Quotations on December 10th were:

STEEL PRODUCTS PRICES

Bessemer steel, per ton, mill	18 00 a18 50
Open hearth, per ton, mill	18 00 a18 50
Sheet bars, per ton	18 50 a19 00
Steel bars, soft base, half ex-tidewater	1 21 a.....

The above prices are at tidewater in carloads and larger lots. For quantities less than 2000 lbs., but not under 1000 lbs., $2.00 per ton additional is charged, and less than 1000 lbs., $8.00 per ton additional.

SHEETS

The following prices are for 100-bundle lots and over f. o. b. mill; smaller lots $2.00 per ton higher.

Gauge—	Black.	Galvanized.	Gauge—	Black.	Galvanized.
Nos. 22 & 24	1 60	2 35	No. 28	1 75	2 80
Nos. 25 & 26	1 65	2 45	No. 29	1 80	2 95
No. 27	1 70	2 65	No. 30	1 85	3 10

IRON AND STEEL AT PITTSBURGH

Bessemer iron	14 70 a ....
Bessemer steel, f. o. b. Pittsburgh	18 00 a18 50
Muck bars	28 00 a ....
Skelp, grooved steel	.... a 1 15
Skelp, grooved iron	1 50 a ....
Ferro-manganese (80 per cent.), seaboard	68 00 a70 00
Steel, melting scrap	10 25 a10 50
Steel bars	1 00 a 1 05
Black sheets, 28-gauge	1 85 a 1 90
Galvanized sheets, 28-gauge	2 85 a 2 90
Blue annealed, 10-gauge	1 35 a 1 40
Tank plates, ¾ and heavier	1 00 a 1 05

Rubber Shows a Distinct Advance

Since last month, the prices of crude rubber have advanced on most all grades. In some cases the price has advanced $.15 or $.16 per pound. Quotations on December 10th were:

Up-River—			
Fine	70	a	71
Coarse	53	a	..
Island—			
Coarse	31	a	32
Cameta	34	a	..
Caucho Ball—			
Upper	54	a	55
Lower	53	a	54
Centrals—			
Corinto	46	a	47
Esmeralda	46	a	47
Guatemala, slabs	42	a	45
Mexican—			
Scrap	45	a	..
Strips and scrap	44	a	45
Guayule	..	a	..
Balata sh't	55	a	60
Ciudad, b'k	..	a	..
Trinidad, b'k	Nominal		
Africans—			
Massai, red	..	a	..
Red C'go	Nominal		
B'k C'go	..	a	..
Soudan—			
Niggers	Nominal		
Gambia, prime	..	a	..
East India—			
Sm'k. sh'ts	80	a	85
Ceylon, bis. & sheets	74	a	..
Pale crepe	76	a	77
Pontianac—			
Prime plantation	6	a	..
Palembang	6	a	..

DOMESTIC SCRAP RUBBER

Boots and shoes	7¼a 7½
Tires—Automobile	5 a ..
Inner tubes	16 a 17

Public Utilities Company, Hot Springs, Ark., recently installed an electric motor 'bus costing $5000, with a carrying capacity of twelve passengers, for the purpose of carrying passengers from the end of the Malvern Avenue car line to the golf links.

The War Department has decided to hold comparative tests of various types of motor tractors, with a view to ascertaining or developing a vehicle which will be suitable for army work in transporting ammunition and equipment.

H. W. Johns-Manville Company has just announced the addition of two new auto clocks to its extensive line of automobile accessories, one for flush and one for dash board mounting, both embodying the latest approved ideas in auto clock construction in an eight-day fully guaranteed timepiece.

The Ham Lamp Company, of Rochester, has been taken over by the R. E. Dietz Company. The Rochester factory will be dismantled and is now for sale. The present styles of the complete line of Cold Blast motor truck lamps will, however, be manufactured and sold under the Ham trade name.

Boston Police Department will have a new 1915 G. V. worm-drive electric patrol.

General Motors Company, Detroit, Mich., at its annual meeting, re-elected the retiring Board of Directors, and the directors re-elected the officers.

Willys-Overland Company and the Garford Company, at a recent meeting elected the following officers and directors: John N. Willys, president of both companies; Isaac Kinsey, first vice-president; C. S. Jameson, second vice-president; Royal R. Scott, secretary; Walter Stewart, treasurer; W. E. Tigges, comptroller; E. L. Clapp, assistant treasurer of Willys-Overland Company. C. S. Jameson, vice-president; Royal Scott, secretary; Walter Stewart, treasurer, of the Garford Company. Board of Directors of the Willys-Overland Company consists of the officers (with exception of E. L. Clapp and W. E. Tigges) and H. L. Shepler and Rathbun Fuller, all of Toledo. The Board of Directors of the Garford Company is the same, except that H. L. Hooke takes place of Rathbun Fuller. H. L. Hooke was appointed manager of the Willys-Overland plant; John Gerkins, cashier, and E. E. Weise, assistant cashier.

"Weed for Speed" is the title of a new concern opened at 305 10th Street, Toledo, Ohio, for the delivery of light freight packages for merchants by automobile.

Los Angeles Interurban Motor 'Bus Company has started a motor 'bus line between Orange, Whittier and Los Angeles. Later other 'buses will be added, and four trips made daily.

The City of Chicago is considering an ordinance to prohibit the storage of inflammable oils within the city limits. If this passes, it will affect the oil companies, garages, gasoline supply stations and owners of motor trucks who have large fuel tanks.

Paris is using five hundred motor 'buses transformed into meat wagons, which supply 750,000 men with fresh meat daily. Each 'bus carries nearly 4000 lbs. of meat, and one 'bus can bring up all the meat required by an infantry regiment comprising three battalions of 1000 men each. Twice as many 'buses are being used as are really necessary to assure a regular service and to allow for unforseen circumstances.

The CCJ has most readers because it gives most information

Persistence, Intelligence and Confidence, Chief Requisites of Successful Truck Selling

An Interview With a Well-Known Metropolitan Sales Manager

By RICHARD WRIGHT

"WANTS me to tell you how to sell trucks, does he? Well you tell your editor that if I knew the secret, I wouldn't sell it for any amount of money, much less give it away." The man at whom the question was fired without any preliminaries is the head of the New York branch of a concern that has "made good" in truck selling in the metropolis. He looked so puzzled at being asked such a question that the interviewer began to have compunctions about taking a busy man's time—something that newspapermen are not often afflicted with, and asked to be turned over to the sales manager.

"No, we haven't a salesman in the place that knows anything about selling trucks. Come to think of it," he went on, "there isn't any secret at all. It's just a case of hammer, hammer, hammer. That's all there is to it. How do you sell advertising?" The writer was compelled to admit that he didn't have in his possession any golden secrets or magic formulæ that would do the trick, and though he wasn't selling advertising, opined that nothing short of intelligently applied persistence brought successful results in selling anything.

"That's just it" was the quick come back. "If I could knock either intelligence or persistence into a man he'd be a salesman. But usually one or the other is lacking and lots of 'em have neither. Tell your editor." he went on, after a long pause "that some day I'll write out what little I know about it and send it to him."

The net result of this interview neither affording sufficient copy to placate an irate editor intent upon having the right kind of a "story," nor enough of the right kind of "dope" to make a man a successful truck salesman in one lesson by correspondence, the writer tried further afield in the hope of finding some New York dealer who not only knew how to deliver the goods, but was not averse to telling about it. Without much success, however, until he met R. E. Taylor, sales manager for the R. & L. Company, handling Garford trucks.

Like all successful men, Mr. Taylor is modest and wasn't willing to acknowledge that he knew anything about truck salesmanship that wasn't already a matter of common knowledge to everyone in the field. But by dint of applying some of the "hammer, hammer, hammer" formula in the questioning line, an outline of the system that has been responsible for making what can be regarded as an unusual record in truck selling was obtained. When it is borne in mind that more than seven hundred high-priced trucks have been marketed by this company in its territory in the past two and a half years, not to mention many used machines taken in trade, this is putting it moderately. Any sales manager might well be proud of such a record as that, but as I said before Mr. Taylor is a modest man, and if any of the statements made here apparently savor of egotism they may be put down to the writer's transcription of his remarks, rather than to any desire to over estimate the personal equation in the matter.

"It's all bunk about salesmen being born and not made" was the terse reply to a query as to where the sales manager obtained his raw material. "Of course, good personal appearance and a pleasing address are valuable assets, but the chief thing any man needs to become a successful salesman, is confidence. Confidence in what he is selling, in himself and in his employers is the first requirement" was the way he summed up the "ensemble" of the man who is fitted to go out and bring home orders. "Actual experience in truck selling probably counts for less than any other single factor" he added. "But don't put me down as saying that any man, regardless of whether he knows anything about trucks or transportation problems, can start right out and make a success of it. To sell anything, a salesman must be able to talk his subject intelligently, for he will meet many prospects who know a whole lot more about it than he does, and the busy head of a concern, large or small, doesn't want to waste his time talking to a salesman who doesn't know what he is selling. The point I wish to make is simply that a man doesn't have to be born into the truck business or serve a life-long apprenticeship at it to become a successful salesman. Probably the best evidence of that is the fact that we have a man on our staff who was getting $18 a week as a bookkeeper in a Paterson mill only a year and a half ago, and now he is making close to $15,000 a year selling Garford trucks for us.

"Of course, he's a shining exception, though we have another salesman who does equally well. Taking them as they come, though, the truck salesman won't average much more than $50 a week, and his results come by fits and starts. When he's two or three sales to the good he thinks things are just naturally coming his way and he doesn't have to work very hard. But when he's 2 or 3 months behind his drawing account he is apt to come to the conclusion that there's nothing in the business of selling trucks anyway and relax his efforts at that end of the line. Between these two sags in the production curve, he may do some real hustling but it's hard to keep them plugging at it steadily. From that point of view, the salesman is as moody as a poet. He has recurring periods of elation and depression and various kinds of weather in between, during which he regards most of his prospects as hopeless and decides that he won't call on them that day. What's the use? He saw all of them within the last 10 days and there was nothing doing so what earthly use is there of chasing around to see them again? The fact that he may not have called on several of his prospects for the better part of a month doesn't seem to have much influence in changing that particular mood.

"We have a pretty good cure for that kind of feeling though," continued Mr. Taylor. "Every Saturday afternoon at three o'clock we have a get-together meeting and I regard it as by far and away the most important single item in our selling system. One of the salesmen has had 2 weeks' notice to prepare a short paper on some angle of selling as it appeals to him, and, after he has read it the points he makes are brought up for discussion. Then there is a recital of experiences and every man is given an opportunity to get any grouch he has out of his system. It's positively dangerous to let a salesman hold on to a grouch for more than a week. The effect is cumulative and it is apt to get so bad that he can't think of anything else, and least of all selling. So our weekly experience meetings are held religiously and they do a wonderful lot of good in heartening the men up for the following week's work. Each one of them feels a whole lot more like getting out and hustling Monday morning than if he had stored a grouch in his system over Sunday. Not that the truck salesmen get their Sundays to themselves. We're open 7 days a week and many an appointment is made and many sales closed on Sundays. That's really one of the so-called secrets of salesmanship and it's nothing more or less than keeping everlastingly at it.

The Scouts

"Yes, we have a system of finding prospects that is as important in its way as the selling system to which it acts as a feeder," replied Mr. Taylor when asked how he managed to get enough material to keep fifteen salesmen constantly busy. "There are a great many people to whom we sell trucks, that aren't to be found in the credit rating books so we can't look to Bradstreet's or Dun's for our prospects. From this office we cover all of Long Island, up the Hudson River as far as Kingston, about 80 miles, and down in New Jersey to and including Trenton, so that roughly speaking we have a radius of about 100 miles. The large towns are covered by resident dealers, but everything in between is taken care of direct from this office. This territory is covered by five "scouts"—young fellows of twenty to twenty-five, whose only business is to obtain information. They have a regular list of questions to ask and are not permitted to try to do any selling.

"The prospects turned in by the scouts together with those obtained through the office and in other ways are put on index cards, and transcripts from these cards are handed the salesmen. Every salesman must be out of the office by 9.15 in the morning, and, unless he has office appointments to keep, must spend his entire day making calls. He must make a report on every prospect on whom he has called, giving

The CCJ has most advertisers because it gives them biggest returns

verbatim, as far as possible, the answers he has received. This gives us a line on the methods he is employing and makes it possible to help him by providing answers to questions that may have stumped him. It also provides a means of keeping a check on the salesmen. On a rainy day some of them are apt to decide that there's not much use in making calls and a moving picture show is a whole lot pleasanter way of putting in the afternoon than plodding around in the wet. Others think a fine, bright afternoon is an equally good excuse for patronizing the movies or a matinee.

"Close check is kept on the progress made with various prospects as shown by the cards and where a report indicates that a prospect has not been called on during the preceding 30 days, it is transferred to another salesman. That's another shortcoming of many an otherwise good salesman. He always regards new prospects as presenting the most favorable opportunities. Of course, it's human nature to work along the line of least resistance and in following this out, the salesman accumulates a fine list of dead ones. Dead simply because they have been neglected so that in all probability some competing salesman to whom they are new, has closed them up. So that it's part of our system to see that there are no dead ones on the list. When for some good reason they do become dead so far as our chances of selling are concerned, their cards are endorsed with the reason therefor and are filed in a dead list, so that none of our men will spend valuable time in following up blind leads.

Data Bureau

"No, we could hardly afford to do that" responded Mr. Taylor, when asked if a brand new man who knew neither trucks nor trucking was turned out on his allottment of prospects to sink or swim, according to his ability. We maintain a data bureau that is kept up to date from all possible sources of information. Condensed reports from this in typewritten form are supplied the salesmen to keep them informed. If he has had no previous experience whatever, we drill a man on the truck itself until he is well equipped to answer almost any sensible question that may be asked. But the day of horse haulage is far from being past as yet, so that the prospect is far more apt to want to know what the truck can do for him than he is to spring any abstruse mechanical questions. The salesman must make a study of that man's business and particularly of his transportation problem. That's where the data bureau is of assistance to him. We have some salesmen who have made such a thorough study of certain lines of business that they are really better equipped to talk about its transportation needs and the best methods of meeting them, than are many of the men in the business itself. So you see, it isn't all simply a matter of persistence in calling on prospects.

"If one out of every ten prospects had an order all written out to hand to the salesmen when he called, some of them would pile up big returns. They will diligently cover a big list, but they're simply order takers, and an order taker is so near to being a dead one that he might just as well be an undertaker. When one of that type brings home an order, the chances are that a bright messenger boy could have done equally well. Such a man is lacking in one of the essential qualities of a salesman and no amount of persistence in plugging away will take him very far. The persistence is absolutely necessary, of course. Only the man who has had experience in selling can realize how many calls must be made before the prospect is found in a receptive mood. He may be out or away several times hand running, or any one of a dozen things may prevent the salesman from getting an audience when he does find his man in. But sooner or later, if he keeps on the job, the salesman will catch his prospect right. That is his opportunity and it is the salesman's ability to take advantage of it by putting up not only an intelligent argument, but one that will appeal to his audience, that determines the salesman's success. Under such circumstances the order taker type of salesman is apt to make a nuisance of himself, while the man who means well but is not well informed on that particular business, is likely to make blunders that not only react against the salesman himself but against the house as well. That particular salesman becomes a joke to the prospect and by inference the house is made to share the same unfavorable opinion. Then it takes a tactful and diplomatic hand to eradicate that false impression, so that tact is naturally one of the successful salesman's valuable assets. Some salesmen never know when to talk truck and when to talk baseball and when some of them get started on a baseball argument they forget all about trucks and what they came for.

"Of course, human nature is the same the world over, whether in the salesman or the prospect, and the latter is just as apt to make foolish statements as the former. But it's the salesman's business to know how to combat such statements without antagonizing the prospect. He has to accommodate himself and his selling methods to as many kinds of men as there are. For example, we had one man lately who was certain that his horses were good for an average of 26 miles a day every working day in the year. To be capable of that, a horse would have to show a uniform efficiency of 100 per cent. and it would require the very best kind of care to keep him in condition. Our records show that a truck horse can't possibly average better than 17 miles a day hauling loads except under the most favorable conditions and those conditions are not always present by any means. When a prospect persists in a statement of that kind it's simply an indication that he isn't willing to be shown, and no amount of common sense argument backed by authoritative figures will reach him. But in a case of that kind a tactless salesman can do more harm than good. Even with an apparently hopeless prospect, it is sometimes possible to score a point in the first interview and by properly following it up later a sale can often be closed unless the prospect is so thoroughly hide-bound in his opinions that he will insist upon following in the footsteps of father regardless of what modern innovations may have come into use since father made a success in trucking.

"Second-hand cars? Oh, yes; we make a practice of taking used cars both of our own and other makes in trade. Some of our salesman can dispose of used cars much better than they can sell new cars. But in every case it is the salesman's business to sell his prospect the kind and size of truck that will prove most successful in that particular line of business. If the prospect insists on talking used cars, it's the salesman's duty to meet him on that basis and sell him a used car that will come nearest to meeting his requirements. That is, if he cannot sell a new machine, to recommend one that we have in stock that will be the next best thing to it, and not to be satisfied in making the easiest kind of a sale, as that is often likely to spoil a good future customer. It is far better not to sell a truck of any kind than to let the customer sell himself one that the salesman knows from his experience will never prove satisfactory for that particular kind of service. That's the trouble with quite a few—they think their success depends upon making a sale, but that policy often results in selling the customer and ruins all prospect of doing business with him in the future.

"When we take used cars of our make in trade, we give them a thorough overhauling so that they are the very best thing available next to a new truck. With machines of other makes, we simply carry out what repairs are necessary and repaint them. In either case we do not attempt to make any profit on the used trucks. their selling price is the allowance made when taking them, plus the cost of repairing and the salesman's commission, and by giving this end of the business the same systematic attention that we do to that of marketing the product of the factory direct, many opportunities are made for selling new machines. That's a large and important part of any selling system—making satisfied customers.

"Yes, salesmen do shift around a good deal, and that's unfortunate. In spite of the comparative newness of the business, there has grown up a set of regular shifters. 'Drawing account beaters' in other words. They're the kind that are hard to keep from putting in their time at moving picture shows instead of working, for after all, success boils down to a question of hard work and keeping everlastingly at it. Some of these fellows simply make the rounds and they last in each place as long as it takes the sale manager to find out that they are simply working him and their drawing accounts. When the cash is no longer forthcoming they hunt a new job and in that way keep on making the rounds. The fact that there are more or less frequent shifts of management, makes it possible for them to keep this up much longer than they could in an older line of business, as some of these standbys often come around to the same make in the same territory two or three times.

Good Salesmen Change Seldom

"Oh, no, the good salesmen—the men who have made a success, do not change around any oftener than they do in any other line of business. The successful salesman is an exception and he's naturally a much sought after man. Having made good with one particular make of truck he often gets an idea that he could do much better with some other firm. Or

some other concern may offer him a larger drawing account than his present connection regards his sales as warranting. In other words, a little success is often responsible for developing a case of swelled head and before fully considering what is best for his own future, he has made a change. These quick and ill-considered changes are really the cause of some otherwise good men getting into the habit of making the rounds and becoming mere shifters. The new job soon proves to be very different from what is appeared to be before making the change and discontent soon leads to another shift, often as ill-considered as the first, so that the habit of changing is acquired and it's a hard one to break. Our weekly experience meetings are one of the most valuable things devised for keeping the salesmen satisfied and what is far more important, keeping them constantly keyed up. No matter what kind of a kick one of our salesmen may have, we don't want him to keep it in his system. If he'll make it known we're always ready to meet him more than half way on anything that's reasonable. In this way, we keep the mount of shifting down to the minimum. That is, among the men who have proved that they can make good. There is always bound to be a lot of weeding out necessary among new and untried men.

"Of course, service is responsible for a large part of our success in selling Garford trucks. A man who is doing the same amount of hauling with horses that he can accomplish with a five-ton truck doesn't regard the fact that a certain percentage of his motive power is always out of service in the stable as a very serious loss, but when his truck is in need of looking after, the amount per day that its loss represents is a considerable item. So we keep our service department open 24 hours a day 7 days a week and we're always ready to do what is necessary whenever it's most convenient for the owner of the truck to have it done. If his truck is on a long run out of town and needs attention to put it in shape for the next day's work, we're ready to tackle it whenever he can get the truck to us, even if that happens to be three in the morning. And if it's possible to carry out the work necessary to have it on the job again by eight o'clock the same morning, it will be done.

"Credits are naturally a very important part of any truck selling system and we can't depend on the financial rating books for this any more than we can in finding prospects. We make it a practice to study the prospect's business and determine whether he can take advantage of a truck to increase it. Many of our sales are made to small houses that couldn't possibly afford to pay for one of our machines outright. If a study of the business shows that it can earn the cost of the truck itself in anywhere from 2 to 9 months we consider the customer a good risk, though it is seldom necessary to make the payments extend over more than 6 months, and our percentage of losses is small."

What Some Successful Denver Dealers Think

By CHAS. M. SMYTH

IN visiting the truck dealers of Denver there can be found the various stages of success that may be met with in the different establishments of any other line of business. They range all the way from the losing proposition with a future hope, through the numerous ones claiming mere existence, to the few who are enjoying gratifying success.

Why one dealer should be more successful than another in disposing of trucks is rather difficult to ascertain. The wide-awake dealer will analyze his sales as a chemist does in compounding his formulas; and if he finds he is using some "ingredient" in his argument which seems to have more pulling power than others he is pretty apt to use it as long as it has the desired effect. But trade secrets and classy phrases may be all right in an argument, but when once they become common property no longer contain their business-getting punch. In fact the most successful truck dealer does not rely so much upon trade secrets and artful arguments as he does upon the actual treatment of his customers both before and after the sale has been made. A satisfied customer is a constant advertisement to further prospective truck users.

Mr. H. P. Sebolt, who is manager of the Denver Rapid Car Company, and who has turned possibly more trucks than any other dealer in Denver, speaks of his success in the following language:

"In the first place I have chosen a reliable truck to handle. Yes, of course there are many makes of trucks that are thoroughly reliable and efficient; but I chose the make which I believed had the best qualities for the uses for which I intended to sell them, and I have been particular to see that my customers got satisfactory service out of the trucks. I opened a garage in a central and easily accessible location. I liveried my customers' cars at a reasonable figure and was careful to see that each car was in good running condition when it left the garage each morning. When their cars actually needed repairs I charged them as much for the work as other repair men would have charged; but I was careful to see that their trucks needed the least possible repair by giving every part thorough attention each time it came to the garage and keeping the car always in perfect adjustment. If the user was unfortunate to have in his employ a driver who was careless or who did not know all he should concerning the truck he was driving, I encouraged and assisted him in every manner to learn all he could regarding the handling of his car. In making a sale I never lead a buyer to believe that he could get a four-ton service out of a one-ton truck, nor that he could deliver a load to the city limits and get back in 15 minutes; with the result that I have had few dissatisfied customers. Once, when I did find a buyer who afterwards showed dissatisfaction, I laid aside my belief that he had ulterior reasons for wishing not to keep the truck, and took it off his hands and refunded three-fourths of the purchase price after he had given it hard service for 6 months. I know of several sales after that which were the result of that transaction; for they told me it gave them confidence in my willingness to stand by my bargain.

I do not attribute my success to smooth talk and nifty arguments. I sell my trucks by genuine, straightforward statements. I convince my customer that the car I am about to sell him will prove itself a saving over his previous method of delivery, then help him to do so after the purchase has been made. I hold my trade by honest treatment all the time."

Mr. Sebold started in six years ago selling the Rapid truck in Denver. When the General Motors Company later took over the Rapid factory, at Pontiac, Mich., and turned out an improved product under the name of the GMC gas truck, Mr. Sebold continued to handle the latter car, for which he is now Denver sales agent. He has an efficiently equipped repair department in connection with his garage and is ready to repair any break but those of a most serious nature. He can surely be classed among the successful truck dealers of Denver.

L. E. Decker, sales agent for the White truck in the Rocky Mountain district, thinks that dealer most successful who has a strong following of friends with a willingness to "pull" for him. He says he sometimes finds it difficult to make a practical demonstration of the prowess of his truck unless his friends have assisted to pave the way.

Charles Bilz, who sells the Chase truck in Denver, says the successful dealer must possess a minute knowledge of delivery conditions in his locality, and must not attempt to sell a truck to a merchant who does not have sufficient business to keep a truck busy most of the time. He never approaches a merchant who is using only a one-wagon horse delivery.

E. H. Crabtree, who is a dealer in Denver for the GMC electric truck, thinks the most essential attributes necessary for a successful truck salesman is his ability to convince his customer, and afterwards demonstrate that he can save money for him over his previous mode of delivery.

F. L. McFarland, agent for the Packard truck in Denver, says the dealer who can handle a truck which can prove its superiority over its competitors will become the most successful. A dealer with such a truck will not be compelled to cut from 20 to 40 per cent. from his profits as agents of some of the cheaper trucks must do in order to make sales. But he must keep careful records of his trucks' accomplishments in the immediate vicinity and prove its advantages over other trucks; for a merchant is sometimes skeptical about a truck doing in his own locality what may have been credited to it in a different place and under different conditions.

The CCJ is the only truck journal a member of the Audit Bureau of Circulation—Why?

The Use of Trailers Increasing

With Properly Designed Equipment, Can be Made to Pay Handsome Profits
Manufacturers of Trucks Discourage Their Use With Standard Chassis

By E. S. FOLJAMBE

THERE is a growing use of trailers, not only with tractors but with trucks. Looking at this question from a broad viewpoint, the use of trailers is bound to become an important factor in motor transportation, and will increase as time goes on. The contention of many of the manufacturers that it does not pay to use trailers except under very special conditions with trucks which are not specially built for the purpose, is undoubtedly well taken. The improper use of trailers will cause additional wear and tear on the vehicle used as a tractor. More and more makers, however, are taking into consideration the possible use of their motor-driven vehicles for the hauling of trailers, either of the two-wheeled or four-wheeled type, and are preparing for the inevitable.

Special trailers are being manufactured by several companies, and offer a problem in themselves One of the difficulties is the fact that the axles of the trailers have been practically the same as those used on wagons and are altogether too light and too weak for use behind a tractor or tractor truck, where the speed will in all probability be doubled, running sometimes as high as 12 m.p.h. With trailers of 5 to 6 tons capacity, roller bearings are used. The experience of the Knox Company with trailers of 8 to 10 tons capacity has been that bronze boxes give better satisfaction. In the same way platform floors which are entirely suitable for horse-drawn vehicles give way under their loads when the speed is greatly increased. All shocks such as hitting tracks, dropping into holes in the road, etc., are greatly increased when the speed is doubled.

The wagon builders who have gone into this matter are now thoroughly conversant with these facts, and trailers which will stand up are being produced. There are several companies making a specialty of this work, among which may be mentioned The Watson Wagon Company, Canastota, N. Y.; The Troy Wagon Company, Troy, Ohio; Shadbolt Manufacturing Company, Brooklyn, N. Y.; Jacob Press & Sons, Chicago, Detroit Trailer Company., Detroit, Dunkley Company, Kalamazoo, Mich., Indestructible Wheel Company, Lebanon, Ind., and others.

The disadvantages of the use of trailers with trucks which have not been designed for this purpose are ably taken care of in this issue in an article by H. Kerr Thomas, of the Pierce-Arrow Motor Car Company. It is usually necessary to strengthen the parts back of the transmission and the transmission itself should be provided with a lower gear ratio. A ratio of as low as 100 to 1 for emergency pulls, and several speeds is recommended by Pierre Schon, service manager of the General Motors Truck Company.

He states in this connection:

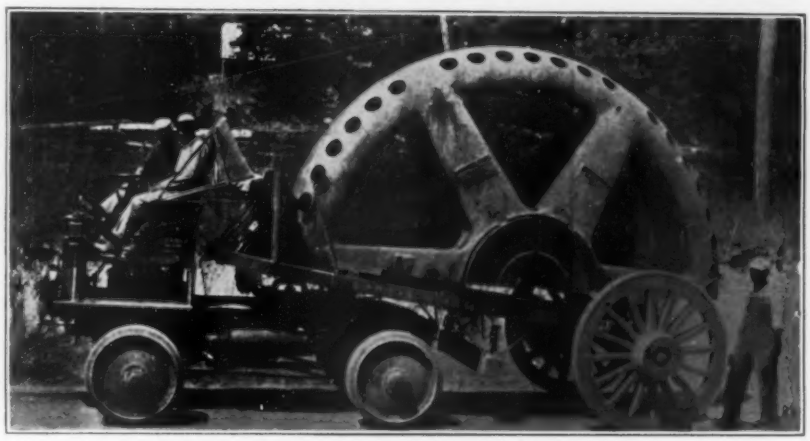
"It will also be necessary to have all parts back of the transmission, such as bevel gears, all differential parts, shafts, sprockets and chains considerably stronger, corresponding with the low gear reduction in transmission and the load to be pulled.

"The greatest objection against using trailers with the Standard American motor truck chassis is the high gear ratio in low speed."

He believes the chain driven chassis to be best suited for use with trailers because of the ease with which great gear reduction can be obtained.

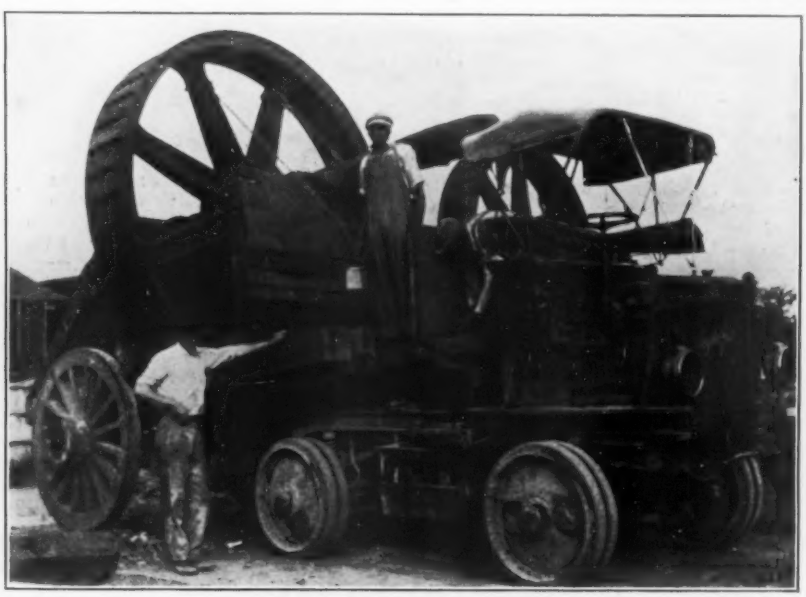
The subject is one which requires considerable study and experimental data should be had. Fortunately, several of the companies are making such tests and in the very near future there will be sufficient data to arrive at definite conclusions. In the meantime, attempts are being made by many users sometimes with the co-operation of the manufacturers of the trucks and also against their wishes.

These statements of course do not refer to devices which have been placed on the market with the special idea of using trailers as in nearly every instance these devices are showing large savings over horse methods.



Twelve-Ton Load on Trailer

This twelve-ton casting was carried in this manner over ten per cent grades, and was found to pull easier than when placed on a separate four-wheel trailer



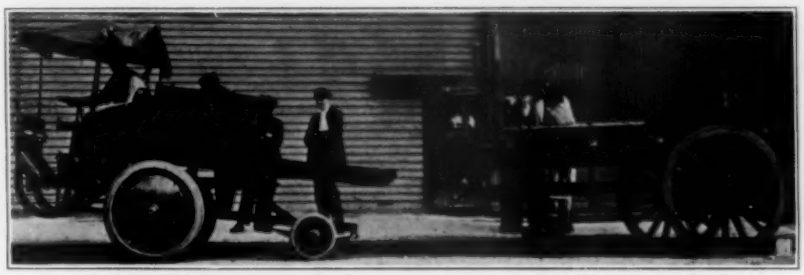
Trailer Carrying Ten-Ton Rotor

This casting and about three thousand feet of timber framing were carried easily over hilly country roads

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

Two-Wheeled Trailers

The Couple Gear Freight Wheel Company, Grand Rapids, Mich., has many of its four-wheel driven electrics, of short wheelbase, used in connection with a two-wheeled trailer, pivoting on the fifth wheel on the truck. These are being used successfully in many places for very heavy hauling. In the accompanying illustrations are shown examples of this work. Such loads as the very heavy armature were successfully carried up grades of 10 per cent. The casting weighs 12 tons, and it was found that in one place as shown in our illustration, it pulled the large chassis, then one placed on an entirely separate four-wheeled trailer. B. J. Buchanan, of Greenville, Tenn., who was in charge of this work says, "It is surprising how often I can save a lot of heavy work by making the tractor do it, such as pulling loads on to the trailer, and even on to itself by using one wheel as a 'nigger-head,' and in dragging heavy pieces from place to place. I even went into the woods one day and dragged out seven logs for derrick booms. These measured from 49 to 60 ft. in length, and 20 to 24 in. in diameter."



Couple-Gear Two-Wheel Tractor With Miniature Trailing Wheels

These small wheels enable this vehicle to move about as a separate unit, so that it can be connected up by means of a steel framework extending to the rear of a vehicle, such as that shown behind it. The one illustrated is used by the Curtis & Pope Lumber Company, of Boston.

Another illustration shows a ten-ton rotor together with 3000 lbs. of timber framing on the trailer. These are typical of the kind of loads that are being moved every day by this combination.

As to the matter of connection, the four-wheel tractors in every case carry a two-piece fifth wheel or universal coupling, the same being mounted within the frame. The upper plate carries a transverse trunnion bar which is attached pivotally to the converted body, thereby giving a full universal connection, between the converted part and the tractor. The two-wheel type of tractors is regularly connected to the converted part permanently or practically so, the frames being bent to fit and securely bolted in place.

The quick detachable type, as illustrated, allows the frame to tilt upward so that the two small pilot wheels come in contact with the ground when backed to the body, the tapered rear end of the frame strikes channel steel inclines which are attached to the body permanently, thus causing the pilot wheels to lift from the ground and the tractor backs itself into a firm connection with the rear part of the vehicle.

The United States Government is using these electric trucks and trailers for hauling carloads of material from the sidetracks in Springfield, Mass., to the arsenal.

Two Dump Wagons as Trailers in Road Building Tests

Tests of trailers are becoming more frequent. The following is a record by Henry Farrington of the Thomas B. Jeffery Company on one of its four-wheel drive and steer trucks familiarly known as the "Quad." In this test the Quad and one driver with two extra shovelers did as much work as nine teams, that is, eighteen horses or mules, nine wagons and nine drivers. He states that:

A saving of $35.43 per day was demonstrated by the Quad truck fitted with a hand-operated dump body and pulling two trailers on a concrete road-building operation near Kenosha, Wis. The date of the test was October 5th and the work was done for George Wade, a road contractor. The round trip distance was 5.4 miles.

At this rate of saving, the truck and its trailers would pay for themselves in 123 working days. Or, to put it another way, the Quad hauling outfit would show a clear profit of $10,644 in a year of 300 working days of 10 hours each, after making a generous allowance for every possible item of expense. This is a net return of over 244 per cent. per year on the original investment.

This will be good news for road commissioners and contractors. And as the cost of actual construction has been reduced to about the lowest possible figure, with the equipment and methods now available, it follows that the only way the contractors can accept the work and still make money it to cut the cost of hauling their material.

For the road in question, about 2000 cubic yards of material to the mile had to be hauled. The cost per yard hauled by the Quad and its trailers was $.27 for the hauling plus $.07 a yard for the additional labor required in loading—a total of $.34 a yard as compared with $1.00 by team. This is a saving of $.66 a cubic yard, or $1320 a linear mile (2000 cubic yards.

The roads over which the material (No. 5 gravel) was hauled, were much better than the average roads in this class of work. Exactly one-half of the 2.7 miles each way was concrete road, built by the contractor for whom the Quad was hauling in this case. A complete census of the various roads traversed is given in Table I.

On the concrete road, the Quad with its two loaded trailers, carrying 7 tons in all, made a steady speed of 10 m.p.h. without the slightest trouble. The average speed over the rest of the road was only 5.72 m.p.h.; but this included two-fifths of a mile of loose, sandy dirt road, on which, in places, the speed of the Quad with its trailers had to be reduced to about 2 m.p.h., on account of the rough going.

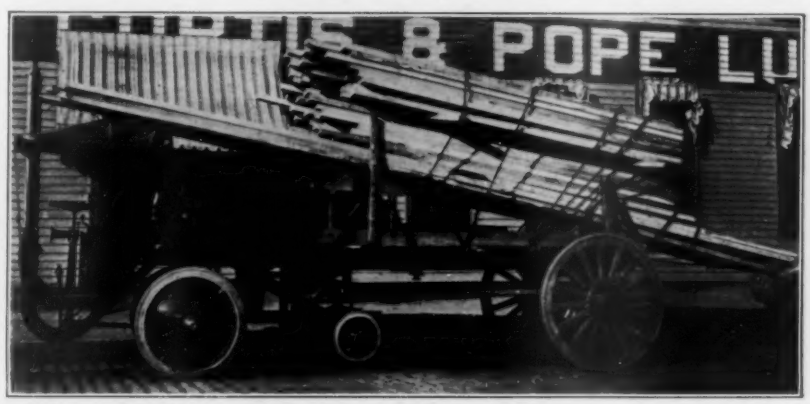
The material was hauled from a railroad team track near the center of the City of Kenosha, to the head of the concrete road on Park Avenue, which is being extended to a distance of about 3 miles from the city.

On this job, Contractor George Wade has been using teams, some of which he owns and some he hires, at $6.00 a day. Usually he employs nine or ten extra teams a day, at a cost of $54 or $60, respectively, for their hire. A wagon hauls 6 cu. yds. of gravel a day.

The hire of the wagon costs $6.00 a day. So the cost of hauling the gravel by team is $1.00 a yard, not counting the extra men who are kept at the team track to help in loading the wagons.

In order to prevent undue congestion at the team track, Mr. Wade constructed a portable hopper loader, shown in one of the illustrations. This hopper holds 8 cubic yards, and is kept as near full as possible, all day long, by the team track gang with the assistance of the teamsters. By means of this loader, the truck with its long open body can take on a capacity load of 1½ yards of gravel in 2 minutes.

The Quad was driven by a driver from The Thomas B. Jeffery Company's factory, and the test was in charge of a member of the Jeffery Truck Sales department. There



Electric Tractor Combination Wagon

This couple-gear unit connects directly to a two-wheeled trailer, forming a single unit; the small wheels at the rear of the driving front wheels enable this fore carriage to move about as a separate unit. In the position shown, they are raised to give sufficient road clearance while not in use. These wheels are raised from the ground automatically as the tapered rear end of the frame comes in contact with channel steel inclines, which are attached to the body.

The CCJ has most readers because it gives most information

was no previous rehearsal before the day of the test.

The first trip was made with the Quad and one trailer. Being new to the job, it took 6 minutes to load the truck, 3½ minutes to couple up the trailer, 24 minutes to make the haul out, 16½ minutes to dump the truck and trailer and couple up for the return trip, and 13½ minutes to make the run home. About 3½ yards were hauled on this initial trip, and the round trip time was 63½ minutes, a comparatively poor performance in view of what was done later, although even so, it was a big improvement over the teams.

On the second trip it was decided to take two trailers and lighten the load carried by the truck, which was inadvertently overloaded on the first trip. The wisdom of this course was proved by a material increase in the outgoing speed, which averaged 7.28 miles an hour with the two trailers as against 6.75 miles an hour with the single trailer on the first trip. On the concrete road, the Quad and its two trailers kept up a steady speed of 10 m.p.h.

On this second trip, with the experience of the other to go by, the time to load the truck itself was reduced to 2 minutes 15 seconds, although there were still several avoidable delays included. The test showed the following methods to be advisible:

1. To use four trailers, leaving two at the team track to be loaded while the others were being trailed behind the Quad.

2. To hire enough extra shovelers at the team track to keep the hopper and the two extra trailers always full when the Quad arrived with its two empty trailers at the end of each trip. The two loaded trailers were coupled together and ready to be fastened by a clevis to the spring-supported trailer ring on the rear frame member of the Quad, without loss of time.

3. To us one of the teams on the job to reverse the trailer wagons after dumping their loads at the end of the run, while the Quad was making its turn in the deep sand off the end of the concrete road. (The road was only 14 ft. wide at this point).

4. To let the Quad driver do nothing but drive his truck, and leave to the other men such operations as coupling, uncoupling and dumping both the trailers and truck.

With these qualifications, it was found possible, after making liberal allowances for all uncontrollable delays, to make the following times in the series of operations constituting a complete round trip:

Time to load Quad	2 min. 0 sec.
Time to pick up loaded trailers	0 min. 45 sec.
Running time to job	22 min. 15 sec.
Time to dump Quad and trailers, turn trailers around, reverse Quad, and couple up again	9 min. 45 sec.
Running time to team track, Quad and trailers empty	15 min. 15 sec.
Total	50 min. 0 sec.

At this rate, the Quad and its trailers can make exactly twelve complete round trips in a 10-hour day on this particular job.

The test further showed that rather more than 5 miles were averaged to a gallon of gasoline, including both the outgoing and incoming journeys. The oil figures were also carefully kept and appear in Table II. The tire cost is an estimate made after careful and long-continued tractor and trailer tests on these very roads. This figure may be too low for the average roads in the same class of work, but it is very accurate in this particular case.

The depreciation item (see Table II) is one which must be considered in connection with the annual overhaul charge

Quad With Two-Ton Load, Trailing Five Tons, Making Seven Tons in All

This trail covered two-fifths of a mile of loose, sandy, dirt road on each trip

TABLE II.—TRUCK STATEMENT

Fixed Costs, Per Day

Interest on investment of $3350 ($2750, cost of chassis, plus $600, cost of dump body) at 6 per cent., is $201 a year, which, reckoning 300 working days to the year is, per day	$0.67
Garage rent, dead storage, $10 month, which, reckoning 25 working days to the month, is per day	0.40
Painting and annual overhaul (excluding running repairs) $150, which, reckoning 300 working days to the year, is, per day	0.50
Insurance and taxes, per year, $180, or, per day	0.60
Driver's wages, per day	3.00
Total Fixed Costs, Per Day	$5.17

Variable Costs, Per Mile

Tires, per mile	$.0178
Depreciation of chassis (less tires), assuming life of 7½ years at 65 miles per day is, per mile	.0167
Depreciation on dump body (value $600, life 5 years) is, per mile	.0060
Gasoline, average 5 miles to the gallon (truck loaded and unloaded), at $.15 per gallon (to allow for possible tax increases) is, per mile	.0300
Oils, waste and grease, per mile	.0040
Repairs to truck, per mile	.0300
Repairs to dump body, per mile	.0040
Total Variable Cost, Per Mile	$.1085

TABLE III.—TRAILER STATEMENT

Fixed Costs, Per Day

Interest on investment of $1000 (four Bain 1½-yard patent dumps at $250 each) at 6 per cent., is $60 a year, which, reckoning 300 working days to the year, is, per day	$0.20
Yard charges for storage, four trailers, at $3.00 a month each, are $12, which, reckoning 25 working days per month, is, per day	0.48
Painting and annual overhaul (say $60 a year for four of them) amounts, per day, to	0.20
Total Fixed Costs, Per Day	$0.88

Variable Costs, Per Mile

Depreciation on two trailers (two running while two are being loaded), per mile	$.0100
Grease, etc., for two trailers, per mile	.0030
Repairs and maintenance, for two trailers, per mile	.0100
Total Variable Costs, Per Mile	$.0230

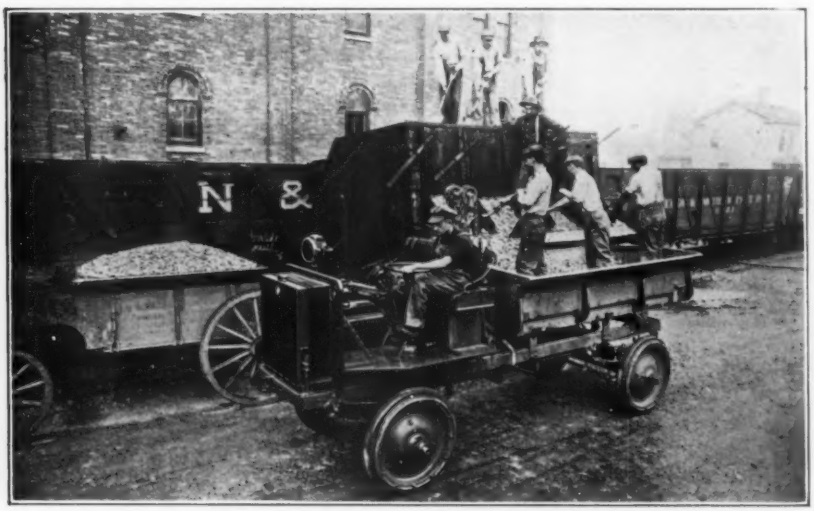
TABLE IV.—QUAD AND TRAILER STATEMENT

Total Fixed Costs, Per Day

Quad truck	$5.17
Trailers	0.88
Total	$6.05

Total Variable Costs, Per Mile

Quad truck	$.1085
Trailers	.0230
Total	$.1315



Loading Quad by Hopper at the Team Track

These hoppers are movable, and are mounted on an ordinary wagon, so that they can be drawn up to the side of the railroad car and loaded by the workman, in the absence of the truck

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and the repairs item. A life of about 7½ years is assumed for the truck, and if the machine made twelve trips a day on such a job as the one under consideration, it would run about 65 miles a day, or approximately 20,000 miles a year. At this rate, the $.03 a mile allowed for repairs amounts to $600 a year, which, added to the $150 a year for the annual overhaul, makes a total of $750 a year to keep the truck in first-class condition.

With these things in mind, it will be admitted that the charges made against the truck are quite high—much greater than would probably be incurred in an average case—so that the comparison of Quad versus teams is eminently fair toward the animals. The trailer charges, so often omitted in calculations of this kind, are given in Table III. Even the depreciation and repairs on the body are figured separately.

The Quad and trailer costs are grouped in Table IV, showing that in the case under consideration an outfit of one Quad and four Bain patent dump trailers (two working and two being loaded at the track) can be operated on this particular job for $6.05 fixed costs per day (incurred whether the mileage is small or great) plus $.1315 a mile for every mile operated.

Table V gives the total daily operating costs for this hauling outfit for five, six, seven, eight, nine, ten, eleven and twelve trips a day. If the Quad is operated more than 10 hours a day, the total costs can be ascertained by adding the extra mileage cost at $.1315 a mile plus the cost of extra driver.

Table VI shows these costs worked into cost per yard hauled, and the cost per yard-mile, not counting the cost of extra shovelers that may be needed at the team track.

This extra cost, however, is taken care of in Table VII, which is the most informative of all. This table shows that with only five trips a day, the Quad outfit with one extra shoveler is equivalent to three and three-quarter teams, saves $10.90 a day over team costs.

With twelve trips a day, which has been shown to be possible, the Quad with its hand-dump body and four trailers, costing $4350 altogether, saves $35.43 a day and should therefore pay for itself in about 5 months.

Table V.—Hauling Costs With Quad Two-Ton Truck and Four Trailers, Two Working and Two at Team Track.

No. of Trips Per Day	Miles Per Day	Fixed Cost Per Day	Running Costs at 13.15 Cents Per Mile	Total Cost Per Day
5	27.0	$6.05	$3.55	$ 9.60
6	32.4	6.05	4.26	10.31
7	37.8	6.05	4.97	11.02
8	43.2	6.05	5.68	11.73
9	48.6	6.05	6.39	12.44
10	54.0	6.05	7.10	13.15
11	59.4	6.05	7.81	13.86
12	64.8	6.05	8.52	14.57

Table VI.—Costs per Yard and Yard-Mile of hauling Gravel by Quad Truck and Trailers, as against $1.00 a Yard by Horses.

No. of Trips Per Day	Total Cost Per Day	No. of Yards Hauled Per Day	Cost per Yard Hauled	Cost Per Yard-Mile
5	$ 9.60	22.5	$0.42	$0.15
6	10.31	27.0	0.38	0.14
7	11.02	31.5	0.35	0.13
8	11.73	36.0	0.32	0.12
9	12.44	40.5	0.30	0.11
10	13.15	45.0	0.29	0.11
11	13.86	49.5	0.28	0.10
12	14.57	54.0	0.27	0.10

Table VII.—Gross and Net Savings of Quad Truck and Trailers Over Teams, in Road Building Operations Near Kenosha, Wis. George Wade, Contractor

No. of Trips Per Day	No. of Teams for Same Work	Cost of Operating Quad and Trailers	Cost of Hiring Teams	Gross Saving of Quad Per Day Over Teams	Horse Driver-Hours in Loading	Cost of Extra Loaders for Truck and Trailers	Net Saving of Quad Per Day Over Teams	No. of Working Days to Retire Investment Out of Profits
5	3¾	$ 9.60	$22.50	$12.90	7½	$ 2.00	$10.90	398
6	4½	10.31	26.00	15.69	9	2.00	13.69	317
7	5¼	11.02	31.50	20.48	10½	2.00	18.48	235
8	6	11.73	36.00	24.27	12	4.00	20.27	215
9	6¾	12.44	40.50	28.06	13½	4.00	24.06	181
10	7½	13.15	45.00	31.85	15	4.00	27.85	156
11	8¼	13.86	49.50	35.64	16½	4.00	31.64	138
12	9	14.57	54.00	39.43	18	4.00	35.43	123

HOW A SOUTHERN TRUCK DEALER WON SUCCESS

The following communication is from Mark Nabros & Co, of Atlanta, Ga., and shows how this company attained success by legitimate business methods, and by not making promises that it could not live up to.

To the Editor:

Realizing that modern business called for a more prompt delivery of merchandise than the antiquated horse-drawn vehicle, and seeing the great possibilities of the motor-driven vehicle, we closed out our pleasure cars to take up the commercial car business in 1912. Our method of securing prospects is to ascertain the firms using more than two teams, as we consider every establishment employing more than two teams and covering a radius of over one mile, a prospect for motor trucks. For securing out of town prospects we use Bradstreet's and Dun's commercial rate book, writing the general manager a personal letter and following it up until we get some expression from him, at which time we take up his delivery conditions to determine whether or not motor trucks will give him a more efficient delivery system than his present equipment. If, after his conditions have been analyzed, we find that motor trucks will not give him increased efficiency, and reduce the cost of his present equipment, then we advise him of our findings with the recommendation that he retain his present equipment. If our findings are in favor of the commercial car, then we advise him of the capacity truck that will best suit his particular need. The biggest mistake ever made in the truck business is to sell a man a five-ton truck when a one and a half ton would suit his needs. Our method of ascertaining whether trucks are the kind of equipment a man needs, is to get cost figures of his horse-drawn equipment, figuring the interest on his investment, depreciation on same, insurance, shoeing, harness upkeep, wagon upkeep, stable rents or taxes, drivers' wages, etc. We figure the number of horse-drawn vehicles that each truck will displace by figuring the distance each horse is required to travel, and then figure the same way against the truck that we do against the horse, thus enabling us to make a comparison of the horse and truck.

We handle the Federal, Garford, Republic and Standard trucks. The territory which we have covered on these lines is the State of Georgia. We only had a portion of the State when we first engaged in the business, but, due to the fact that our advertising covered the entire State and brought many inquiries from all over the State, we got our territory increased. The one-year guarantee against defects of any nature which the factories give, we consider a very valuable asset to our business, as it demonstrates the manufacturer's willingness to make good his product. The factories which we represent have given us great assistance in terminating sales, by assisting from the factory direct. This has an effective bearing on the prospect, inasmuch as it puts him in direct touch with the manufacturer.

The methods used by the truck salesman, some of whom have been long in the business, are the earmarks of inexperience. The most coveted deals that we have closed were secured mainly by our competitors elaborating on the bad points of our trucks—this is bad business in any line of trade. Another very important feature in the truck business is SERVICE. Service, first, last and all the time, should be as closely associated with the truck industry as the delivery of goods is to the retail merchant. No one wants to go shopping and carry his purchases along with him, and feel that as soon as the merchant has separated him from his money he is through with him. It is not the courtesy shown before the purchase that is most appreciated, but the courtesy that follows the purchase. No firm or individual thinks much of one who sells him a motor truck, and as soon as the check is passed over, "quits him cold" and leaves him to his own salvation, and to the mercy of the public garage. This way of treating customers has been one of the greatest drawbacks to the truck business that the industry has ever been confronted with, inasmuch as it has caused repair bills to run unreasonably high, which increases the cost of operating trucks, and in numerous cases has thoroughly disheartened progressive men who have put down the horse and wagon for the modern delivery system. It has been our experience that service has held our customers to us in every case, judging from the number of repeat orders that are being received.

Following are five reasons which we think are necessary to success in the truck selling business. First, sufficient capital upon which to operate; second, a thorough analysis of the business; third, consideration for the man before the deal is closed; fourth, consideration, after the deal is closed, which is service; fifth, keeping everlastingly at it.

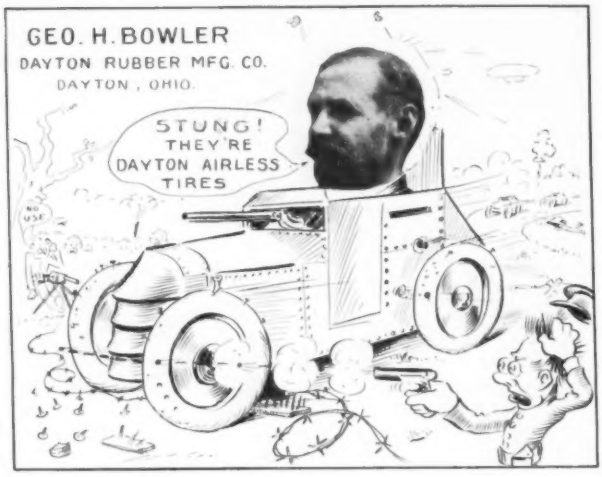
Detroit Automobile Dealers' Association has decided on January 16th as the opening date of the Detroit Automobile Show. Manufacturers and dealers in motor wagons have requested that provision be made for their displays in the same building with automobile exhibits.

The Auto Truck Association, of Philadelphia, has authorized the Traffic Committee to take up with Director of Public Works Cooke the project of abolishing the custom of sprinkling the streets in the daytime. Operators of more than a hundred motor trucks filed a complaint against the practice of wetting and cleaning the streets during the day, claiming that motor vehicle drivers found it almost impossible to keep their machines under control when traveling at a slow rate of speed. This complaint has been received by Director Cooke and will be considered.

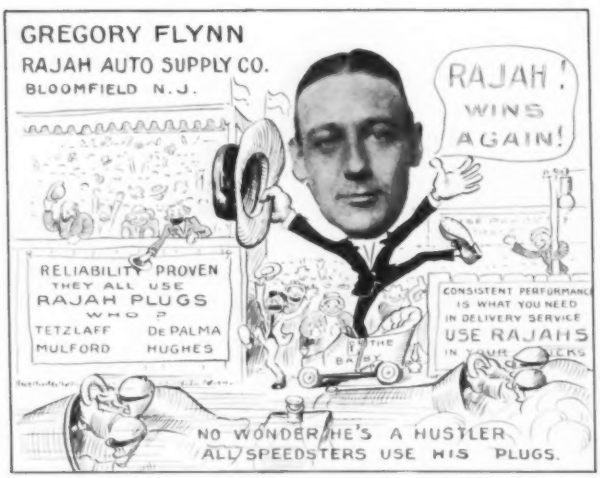
Emil Grossman Manufacturing Company, Inc., Bush Terminal Building, Brooklyn, N. Y., has closed the contest which it recently announced for a name for its new spark plug with one hundred dollars' reward for the successful contestant. By the unanimous vote of the Selecting Committee, the name "Onepiece" was adopted because the new plug is practically a one-piece plug, the porcelain being solidly cemented and baked into the shell and both electrode and terminal cemented and baked into the porcelain. The winner of the prize is Mr. F. R. Darby, 246 S. Broadway, Yonkers, N. Y.

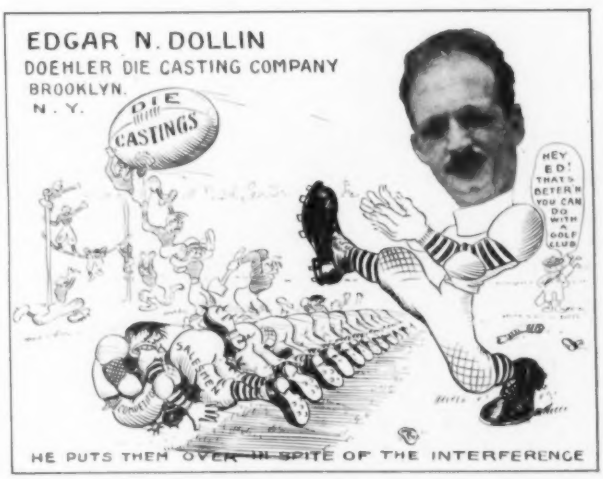
The CCJ leads in circulation, advertising and prestige

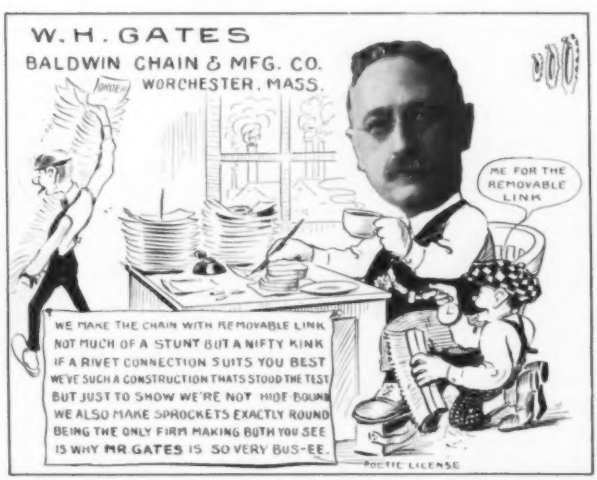
CCJ GALLERY of SALES MANAGERS



H. F. BLANCHARD
KNOX MOTOR CO.
SPRINGFIELD, MASS.
WHICH
STEP RIGHT UP GENTLEMEN AND SAVE MONEY BY GIVING IT TO ME FOR THE LATEST AND MOST EFFICIENT ROAD LOCOMOTIVE
BLANCHARD THE ADVOCATE OF ECONOMY.


GREGORY FLYNN
RAJAH AUTO SUPPLY CO.
BLOOMFIELD N.J.
RAJAH! WINS AGAIN!
RELIABILITY PROVEN THEY ALL USE RAJAH PLUGS WHO ? TETZLAFF De PALMA MULFORD HUGHES
CONSISTENT PERFORMANCE IS WHAT YOU NEED IN DELIVERY SERVICE USE RAJAHS
NO WONDER HE'S A HUSTLER ALL SPEEDSTERS USE HIS PLUGS.


EDGAR N. DOLLIN
DOEHLER DIE CASTING COMPANY
BROOKLYN, N.Y.
DIE CASTINGS
HEY ED! THAT'S BETTER THAN YOU CAN DO WITH A GOLF CLUB
HE PUTS THEM OVER IN SPITE OF THE INTERFERENCE


W. H. GATES
BALDWIN CHAIN & MFG. CO.
WORCHESTER, MASS.
ME FOR THE REMOVABLE LINK
WE MAKE THE CHAIN WITH REMOVABLE LINK NOT MUCH OF A STUNT BUT A NIFTY KINK IF A RIVET CONNECTION SUITS YOU BEST WE'VE SUCH A CONSTRUCTION THATS STOOD THE TEST BUT JUST TO SHOW WE'RE NOT HIDE BOUND WE ALSO MAKE SPROCKETS EXACTLY ROUND BEING THE ONLY FIRM MAKING BUTH YOU SEE IS WHY MR GATES IS SO VERY BUS-EE.
POETIC LICENSE

ROY HARRIS
OF THE
FIRESTONE TIRE & RUBBER CO.
AKRON, OHIO
OTHER TIRE SALES MEN
Tho' often seen at the Astor bar
He's not a drinker, not by far
But watch him close and you'll discover
He's just put a war order under cover
"ROY" ALWAYS ON THE JOB.

The CCJ is the only truck journal a member of the Audit Bureau of Circulation—Why?

Philadelphia Motor Truck Association Monthly Meeting and Papers

THE monthly dinner of November 18th of the Philadelphia Motor Truck Association, Vice-President Hare presiding, proved to be one of great interest to the members. Three papers which are reproduced in their entirety were read, and the subject of the possibility of a truck show in Philadelphia was discussed.

The matter was taken up in detail later, and it has now been decided that the time is not opportune for a truck show in Philadelphia. After the reading of papers, George Graham read a humorous sketch with many local hits that were much enjoyed by those present. Statistician Cattell, who was present, acceded to an unanimous demand that he speak a few words.

At the next meeting there will be a mock trial by members of the association

The following are the papers:

WAYS IN WHICH THE SALESMAN HAS INTERFERED WITH THE SALE OF MOTOR TRUCKS

Suggestions for Remedying these Conditions and Thereby Increasing the Motor Truck Market

By EMLEN S. HARE

IN PRESENTING this paper, I wish to thank some members of this association for their valuable assistance.

My whole line of thought in this article is based on two assumptions and one belief:

First: That the market to-day for motor trucks and delivery vehicles is infinitesimal compared to what it should be if those who could use motor trucks recognized the truth regarding same.

Second: If this market was developed, it would result in our business proving most profitable to all connected with same.

My belief: The success of the motor truck industry, and each one of us, who is so closely allied with this industry, may be assured and hastened by absolute unity and co-operation among all members of this association for the good of our cause.

In regard to my first assumption: It requires but little observation to discover that the field has tremendous scope. Every pound of material of any kind within the range of our vision, excepting alone the original virgin soil and natural growths, has been moved, at one time or another, in some form of vehicle over the streets and roads. Every building has been carted on wheels. All the vast equipment we make use of in any way has been transported. In addition, there is the enormous quantity of transitory merchandise constituting our commerce, as well as our consumed material; the sum total of which transportation might, and some day will, be performed by motor trucks. This surely is a reasonable assumption just as in a comparatively short period in the past a similar transformation has taken place in passenger transportation.

Regarding my second assumption: The prosperity of a company must result in the prosperity of all individuals who have aided to build up, and are capable of increasing, that prosperity, and it is self-evident that if the present market were increased many times over, the volume of each motor truck business would be proportionately increased, and the cost to produce and sell decreased. Particularly would sales be easier to make and much more satisfactory, as with the increased market (which will only come through greater knowledge of the whole truth on the part of those who can use motor trucks) motor trucks will be purchased more and more on the same basis as other staple machinery and merchandise are purchased to-day, enjoying the security of every day trade and commerce.

Regarding my belief: I mean unity among us all, co-operation between this association and proprietary members, and co-operation between proprietary and associate members. I say this because, while the salesman will always be the most important instrument, it is evident to a keen observer that too many difficult problems are left to him; these should be intimately shared, and their solution left to those justly responsible for administrative functions. The general inclination has been to drift with the tide of things, to be satisfied with business that may be readily secured, with little effort to sift out and win by sheer merit the more difficult, but far more profitable, undertakings. Co-operation, as above, can check this tendency and procure the most desirable business.

The excuse that the business is new and that time is necessary to overcome obstacles is no more valid in this line than in others. On the contrary, the reward which awaits industry in this field is infinitely greater than that which falls to the lot of business projectors in other fields. However, these anticipated results will never be secured automatically. They can only be won when the strongest kind of administrative and salesman brains and energy are combined and co-operatively directed against the obstacles involved. Each of us here has undoubtedly in some way, by some method, aided to promote this industry, and if all these ways and methods are combined for the common cause, such unity and co-operation will rapidly advance our industry, and ourselves, to prosperity.

I will not touch on the salesman's personal ability, tact and cleverness in handling individual prospects, as this pertains solely to himself. I will, however, try to point out along what lines this personal ability may be best used to promote the motor truck interests (which is bound to result in the greatest individual good to us all), and how mistakes of the past may be eliminated in the future.

Companies who should use motor trucks may be classified as follows:

First: An active prospect. Meaning a company actually in the market. A company who has decided to buy motor trucks.

Second: An inactive prospect. Meaning a company who has not yet decided to buy, and in this class are those who have never investigated, or who have investigated and are not interested, or those who are interested and investigating.

In endeavoring to sell the first class (the companies actually in the market) the competition is the more keen. An order is actually in sight, and while that should be the time when the salesman is most careful of his statements, yet as such times we frequently find him determined to get this order at any cost, throwing judgment to the winds, making all sorts of unbusiness-like service promises, claims of efficiency and claims of exceedingly low maintenance and operating costs. If after such exaggerations, he obtains the order, it is almost a foregone conclusion that this order will prove unsatisfactory and unprofitable to his house if it attempts to stand back of his statements. Or if it does not stand back of these statements, a dissatisfied user will result and no further orders from this user will be forthcoming. An order so obtained is not worth taking; it can result only in temporary profit to the salesman and reacts against him in the long run. Worst of all, it helps greatly to curtail the sale of motor trucks.

Derogatory Remarks

In handling this class of buyers, the salesman is apt to actually discourage the sale by derogatory remarks—"knocking." Sometimes this is done by simply a general abuse of the construction of other makes which are in competition, but more often by subtle insinuation and reference to certain definite troubles with certain makes of motor trucks that certain users have experienced, and certain high costs of maintenance and operation with these competing trucks. These troubles and costs may actually be true as far as they go, yet if the whole truth were told it would almost always be found that these were exceptional cases probably caused by misuse or lack of proper attention on the part of the user, and that many other users with similar requirements were deriving satisfaction from the same make of vehicles. These latter cases, however, are omitted, just as the salesman only presents figures on maintaining and operating his vehicles based on the most favorable results. (Before going further, I wish to point out that where a salesman refers only to cases where the most satisfactory results are being obtained with the trucks he represents, he misses a splendid opportunity to point out to the user those other cases where his trucks are not satisfactory due to improper handling and attention; thereby, drawing a moral, which in all probability would result in the proper handling and attention of trucks which the prospect might buy.)

In turn, all derogatory statements are hotly refuted by the other competing salesmen; they in turn claiming weaknesses, etc., in the other man's construction, until the buyer frequently feels that a great many defects are still contained in motor trucks. His faith in the project is shaken, and frequently he defers buying indefinitely, feeling he had better wait until the industry is further advanced. I ask you, gentlemen, "Can you blame him?" when out of say ten companies competing for his order only 10 per cent. feel that any one truck is worth using!

Alongside of these evils is that of price cutting and rebating. It was generally

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believed that this had been discontinued, and I was, therefore, astonished last week to learn from a reputable user of motor trucks that (in his own words) "he was just getting wise to the truck game, and that he found he could buy any make of truck he wanted at a cut price and on his own terms." If this gentleman believed his statement, he certainly had not interviewed a great many manufacturers, but undoubtedly, he had interviewed a number, and there were some grounds for his statement. This is surely not an enviable reputation for an industry. It is the kind of reputation that discredits the truck business.

This is one of the problems which must be solved, each for himself, but I ask you, in all candor, is it good business; will you profit by it in the long run, and will it build up the industry?

I believe that the question of price cutting is too delicate a subject for this association to handle at this time, and, therefore, in suggesting remedies to present sales evils, I will omit same, simply mentioning it here as it rightly belongs among the abuses and evils which have aided in killing the motor truck market, and making the industry so far practically a profitless one to the manufacturer.

As an example of the above, suppose a number of companies are competing for an order, and the buyer succeeds in having each reduce his price several hundred dollars and then buys. The relative difference in the cut prices will be approximately the same, between those competing, as the relative difference in the proper prices. Nine times out of ten, the same company obtains the order or would have obtained it originally at the proper price. Now, I ask you, who was the gainer? Certainly not we in this industry who have robbed each other of a just profit.

The welfare of this industry, our welfare, is often injured with the result again of dissatisfied and unprofitable users, by the salesman selling a wrong capacity vehicle or a gasoline truck where an electric is better adapted to the work, or vice versa. Sometimes this results from ignorance or lack of proper investigation on the part of the salesman, but often a wrong type or capacity truck is recommended solely because it is the only type or capacity the salesman is handling. He must get an order. Many otherwise capable salesmen allow themselves and their company to suffer, due to a too great consideration for the customer, or rather a too great desire to please, and too little consideration for his own firm, and the maintaining of strict business precedents, which are essential to the healthy growth and continued success of any business.

In endeavoring to sell the second class (the companies who have not decided to buy) it is necessary to create a desire for motor trucks, and following the line of apparently least resistance, the salesman is prone to talk exaggerated economy rather than efficiency and trade expansion.

It is proper—if dangerous—to talk economy under certain conditions, but many salesmen, in their own overanxiety for a sale, use figures based only on their users who are obtaining remarkably favorable results, and not the average results. This is dangerous, for if the user exceeds, even slightly, the salesman's estimate, he is apt to lose confidence in him and his company.

With both classes of buyers; namely, those actively in the market, and those who have not as yet decided to buy, the salesman has in a number of instances interfered with the future sales of motor trucks by failing to impress the buyer with his responsibility to the truck, and the importance of seeing it receive regular inspection and attention, as well as proper handling by a competent driver. He has known perhaps that some of his competitors were claiming little care was necessary for their "exceptionally fool-proof trucks," and has felt the buyer might deem it a sign of weakness if he told him his truck must receive care. Remember, the buyer must have some brains, or he would not be in a position where he has authority to spend several thousand dollars, and in talking with a man who has some brains, "the whole truth is best."

Having attempted to point out the evil results of wrong methods in selling, I will now attempt to suggest possible remedies for same.

Service Promises

Each company should have its service policy clearly and definitely outlined, and see that all connected with at least the selling end of the business are absolutely conversant with this policy, and that they talk within these definite limits; and in addition, that the salesman take time to explain fully to the purchaser his company's attitude, and just what he may expect as a customer.

Exaggerated Claims of Efficiency

To overcome this, the salesman should know his truck. If it is a good truck, he must realize it, and if so, he will know that exaggerations are unnecessary. If after knowing his truck, he is not enthused with it, he will never be of lasting value to that company or himself while with them, and had better secure employment elsewhere.

Claims of Exceedingly Low Maintenance and Operating Costs, as Well as Talking Economy Rather Than Efficiency and Trade Expansion

We must all realize that, with few exceptions, business getting—or trade expansion with efficiency,—appeals far more strongly to the average man than does economy. It is, therefore, actually easier to appeal to the prospect by talking expansion and efficiency than by talking economy, and besides, it is far safer, as no matter how careful and conservative we may be in giving estimated costs of operation, we cannot control the actual routes, attention and running of the user's truck, and we all know that this is the vital factor which determines the cost of operating and maintaining a motor truck. By this I do not mean that no stress should be laid on economy, but rather that this should be only of secondary importance, fully explained and handled most carefully. If the salesman is competent to analyze the prospect's requirements, and knows that with certain handling and routing economy will result, he should assuredly show same to this prospect, but by all means should clearly point out the co-operation and care of the vehicle necessary, on the user's part, to obtain proper figures, and in addition, should figure so as to allow a fair margin of safety, remembering that no two men's requirements, and the care their vehicles will receive, are apt to be the same.

In making estimates on comparative cost of operating motor trucks against horses, the salesman must know what it really costs to maintain and operate horses in that particular line of business. While there are numerous figures published on comparative maintenance, nothing but real study and experience will enable one to arrive at closely accurate figures in each case, and as a user seldom figures trucking and delivery costs either with horses or motor trucks correctly, the salesman must see that he is properly instructed and suffers no misapprehension through faulty figures of his own. I have seen many cases where a user stated that trucks cost him more to accomplish the same work than horses, but after going over all his real costs on both, it frequently has resulted in his finding that when everything was considered, and properly accounted for, he was actually affecting economy with motor trucks. Each company should have available for all salesmen conservative data on average costs of maintenance and operation of their vehicles under different requirements in different lines of service, and salesmen should learn to profit by these and use them with judgment.

Being Overconsiderate of the User at the Expense of the Dealer

It is important that salesmen remember that a business man likes consideration, but also that as a business man he has less respect, and may even have distrust, for a company giving him undue and unbusiness-like consideration. Remember that business to be really successful must be mutually profitable to buyer and seller. If you don't believe in your make of motor trucks, don't sell them. If you do believe in them, when you sell a vehicle you do the buyer quite as great a favor as he does you. Give value for value received, and you owe him nothing.

"Knocking"

Of this nothing need be said (more than to caution salesmen to be careful that they do not knock even unintentionally), for it is the unanimous opinion, of all those who should know by long experience, in every line of business, that absolutely aside from any moral right or wrong, knocking is poor business. It is never the means of obtaining orders, and often the means of losing them. The man who knocks to-day,—in view of its injuring himself, his company and this industry,—is a fool! and this industry, and his company, have no place for fools.

Failure to Impress on the Buyer His Responsibility to His Truck, and That Regular and Frequent Inspection and Attention Are Necessary to Obtain Proper Results

The remedy for this is for salesmen to know the exact attention their truck should receive, and then tell the truth. Do not hesitate to recommend capable drivers at fair wages; for surely no business man, whose business is worth anything, really expects something for nothing. On the other hand, he knows only too well the truth of the saying: "You can't have your cake and eat it." As a matter of fact, I

The CCJ has most readers because it gives most information

believe he respects you and your company far more for a straightforward attitude, advising him that he must co-operate to get real results. His interests and yours are exactly the same, and he is sure to realize this only too quickly if properly presented to him. Can a prospect or purchaser well deny, or fail to grasp the truth, that such attention is necessary for a motor truck generally running on solid rubber tires traveling over rough streets and roads, when he knows (as you can make him know) that the railroads have for years studied economy and reliable transportation of freight and merchandise, making it a rule to go thoroughly over every locomotive after every few hundred miles, and this in spite of the fact that these locomotives are running on perfectly true steel rails, and not our famous (?) American roads? Can a purchaser well object to paying fair wages to a competent driver, if again this is properly presented to him? Does he deposit four to five thousand dollars in an unknown bank because their interest rates are higher? No! He deposits it with a bank where he knows it is safe and pays for safety by a lower interest rate. Does he put four to five thousand dollars into furnishing his house or buying his trucks and not insure against fire simply to save the insurance rate. No again. He pays for protection and safety. Then why should he not pay a good driver when it means the protection of from four to five thousand dollars invested in his truck. He should, and what's more he will, if you put it up to him properly.

Selling Gasoline Trucks Where Electric Trucks Are Best Adapted or *Vice Versa*. Also Selling Wrong Capacity Trucks, or Selling Trucks to Men Who Have No Business Using Trucks

Until the salesman has conclusively proved his ability and loyalty to the interests of his company, all contracts should be carefully analyzed before they are accepted. Most contracts are at present so worded that they do not become binding upon manufacturer, branch or dealer until approved by an executive officer. It would be well to make this arrangement universal, on the basis that the officer finally accepting contracts has most at stake and is most capable of judging if the vehicle or vehicles purchased are properly adapted to the user's requirements and have been properly sold. Such officer should make it his duty to be absolutely sure that the application is a proper one, and that the truck has been properly sold before he accepts the order, regardless of how desirable this order may appear.

I have presented above suggested remedies for all evils which I have outlined in this paper, believing if followed they will result in salesmen most profitable to the industry, themselves and their company. Such a salesman to my mind should combine both salesmanship and a knowledge of commercial or efficiency engineering. He need not necessarily be a graduate engineer, but he must be thoroughly familiar with his truck, its capabilities and limitations. He should, through study of delivery conditions in various lines of business, be capable of studying each user's requirements and advising him intelligently. The salesman who combines the above is in position of value to the purchaser in advising him regarding the size truck best adapted to his requirements, proper routing and caring for same, and this salesman, by his knowledge, is able to protect an inexperienced user or buyer against his own often poor judgment, which judgment, if unchecked, will result in dissatisfaction, and therefore injury, not only to the motor truck business, but to ourselves, for you cannot separate our interest from the general interest of this industry. A salesman combining the above qualities can create business, where the eventual purchaser may have never even considered trucks before talking with this salesman. The value of such a man, to himself and his company, is too apparent to call for any remarks.

In remedying all sales evils, temptations to sell improperly should be eliminated as far as possible. Along this line, I believe in abolishing the commission basis. I do not suggest this as a means whereby the dealer may reduce selling expenses, but rather as a means to properly reward salesmen in proportion to their actual value and benefit to their employer. I believe a good salesman who has the interest of his company at heart is most valuable, and should be handsomely rewarded. This salesman may sell only ten trucks, but having properly sold them, they stay sold, proving profitable to his company and this industry. Another salesman may sell twenty trucks, but if improperly sold, the ten truck salesman is actually far more valuable, and as the profits of his company are greater on his ten trucks than on the other man's twenty, he is certainly entitled to more remuneration than the twenty truck man, who, under the commission arrangement, makes double.

Let me suggest as this association belongs to us all, that where we experience troubles with users, etc., or in any phase of our business where the experience and co-operation of this body as a whole may be helpful, that we bring our troubles here and discuss them.

In closing let me point out that at least 90 per cent. of those engaged in this motor truck industry are so engaged because they believe that motor trucks are profitable to users, and may be manufactured and sold on a basis profitable to those connected with the motor truck industry. In view, then, of this consensus of opinion, we can positively assume that we are engaged in a business which can develop mutual profits and advantages to user and manufacturer, and this being so, there is obviously nothing to hide, —being sure of our ground, let us have the truth and preach it, so that buyers and users (who have not studied this proposition as we, and hence are not in position to realize its future as we do) may most quickly, and properly, learn the real advantages to be derived from motor trucks. Let us remember that the truth alone is often an untruth in its effect. We must not only preach the truth, but the whole truth, and I believe, if all members of this motor truck association will co-operate as one man, in accordance with these suggestions, that we will bridge many years of unprofitable strife in enlarging the motor truck market, and bringing our business,—which includes ourselves,—to a most lucrative and profitable state.

IN WHAT WAY HAS THE DRIVER OF THE TRUCK INTERFERED WITH THE SALE OF TRUCKS

By LEE J. EASTMAN

As an association organized for the improvement of the motor truck industry in Philadelphia and the extensive territory of which this city is the center, there is at least one point on which we can all agree, namely: That in proportion to the money invested, the effort expended and the quality of the trucks which every conscientious dealer is offering to the purchasing public, we are, individually and collectively realizing but infinitesimal results.

Most of us are aware that in the development and sale of motor vehicles Philadelphia stands far down the ladder among her sister cities. There must then be a reason for this condition. Surely there is no more ideal city for the successful exploitation of motor trucks. Philadelphia, with its expansive territory, its innumerable industries, its multitude of prosperous suburbs and surrounded by the most productive and fertile farm lands in America, is rightly classed as the third largest distributing center in the United States. Distribution means deliveries and deliveries should, by every calculation of present-day methods, mean motor trucks, thousands of motor trucks.

We will agree therefore that conditions here are ideal, or as nearly so as we can reasonably expect, and yet, making all due and proper allowance for the business depression of the past year enhanced by the European war, we are not getting the orders in proper proportion. It therefore behoves us, gentlemen, to look well within ourselves, to study our methods both before and after the consumation of our sales and if therein lies the secret of our failure to produce, to find the remedy for these evils and then to put forth every ounce of energy which God Almighty has given us to correct these conditions that we may come into our own.

If we can achieve this one accomplishment the Philadelphia Motor Truck Association may well consider itself successful beyond its fondest dreams.

My colleague, Mr. Hare, has very forcibly and clearly described to you the way in which the salesman has interfered with the sale of trucks and suggested some valuable remedies. The subject assigned to me is: "In what way has the operator interfered with the sale of trucks," and if you will bear with me I will endeavor to give you the result of my investigation into this subject in which I have received much valuable assistance from many of my fellow members.

It appears to be mutually agreed among us that from 60 to 90 per cent. of the excessive trouble and excessive expense with motor trucks is due to bad handling and it is needless to say that excessive trouble and excessive expense breed dissatisfied owners and these dissatisfied owners are the big stumbling block in the successful sale of our product.

(*Continued on page 49*)

The CCJ has most advertisers because it gives them biggest returns

NOTES FROM THE WAR

By OUR FOREIGN CORRESPONDENT

Germany's Fuel Supply—Is it Dwindling?

IN a previous issue of this Journal we have already recorded the general impression caused in Europe that Germany's supplies of gasoline would be cut off with the stoppage of supplies from the Galician oil fields since the Russian victories in Galicia. Up to date, however, that expectation has not altogether been realized. German resourcefulness is great. Germany at once looked to America for her supplies, and despite denials, there is little doubt that she has been obtaining her gasoline and mineral oils through neutral countries. So far then, the Germans have enough gasoline to go on with, but there is every reason to believe that (more especially since the British have so mined the North Sea as to obtain supervision of the traffic) the present supplies reaching Germany are not sufficient to meet her enormous demands, and that consequently her gasoline reserve is steadily dwindling.

War and the Outlook on the Automobile

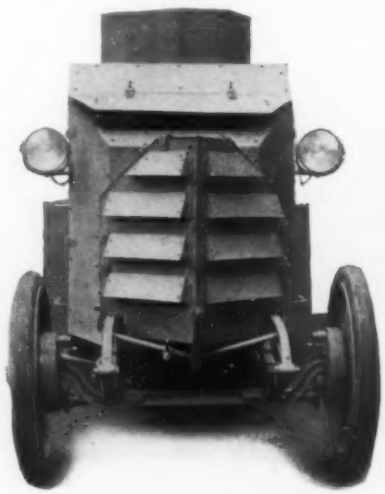
Never before has fuel promised to play such an important part in war, yet though there is much talk of the influence of the automobile, we have as yet not realized the influence of war on the automobile in Europe. There are still people old-fashioned enough to cling to the horse, and to regard the motor as a new fangled toy, just as, even in the early sixties of last century, the railway was still regarded by some, for it must be remembered that the great railway mania had only occurred in the forties—less than 20 years previously. There can be little doubt that the employment of railways for strategic and military purposes for the first time at Magenta put the railway on an altogether different plane; after that many people regarded the railway quite differently—as part and parcel of the established state. So it is with this war and the motor car.

Shortage of Rubber in Germany—A Proclamation

Germany also is beginning to suffer from lack of rubber supply, if one may judge from the action of the authorities who have issued a proclamation prohibiting the sale of tires to private persons, except they be for use on new automobiles intended for military service. Only with the permission of the military authorities can tires be purchased by private persons.

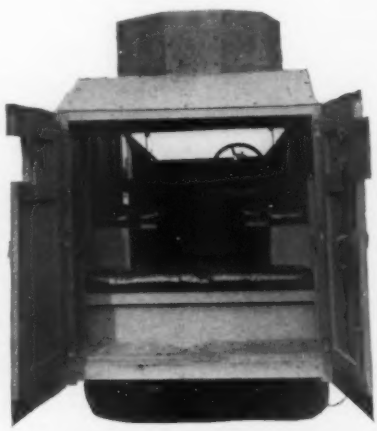
More Careful of the Motor Trucks

During the earlier stages of the war I reported how motors were being run almost up to the firing line. In the retreat from Mons alone over three hundred were sacrificed. Apparently the Allies at any rate have seen fit to modify their methods in this direction, and now that the trucks are not being run so far to the front, there is reason to think that this fact will materially lessen the enormous wastage, though doubtless the supply required to repair the wastage will still be huge enough as manufacturers in United States of America will doubtless find to their satisfaction.



Front View of the Russian 100-120 H. P. Armored War Car

Showing protection of radiators and their ventilation by louvres



Interior Arrangements of Russia's Armored Motor Car

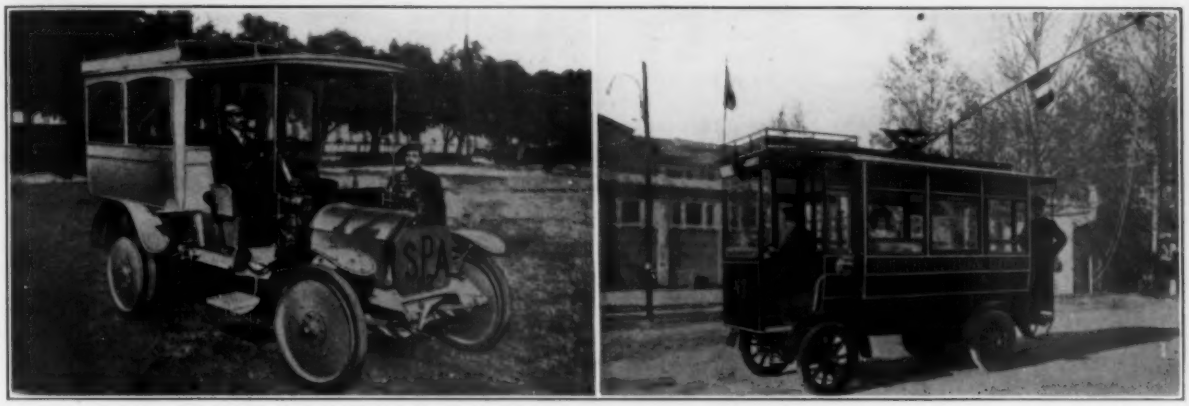
Incidentally gives an idea of the thickness of the plating

Although at the beginning of the war it was found that the need for standardization was not so great as expected, it being a matter of grouping together in convoys trucks of similar speed rather than similar make, as the wear and tear of the terrifically heavy service and the deterioration of roads comes to be felt more and more, the possibilities of interchangeable parts are being more thoroughly realized. Many a car that has been scrapped might with advantage have been used piecemeal for keeping other less lame ducks in running order.

In the present war it is some achievement for any particular form of arm to win official commendation, so those responsible for the production of armored motor cars may congratulate themselves on the testimony of "Eye Witness," which name hides the identity of Col. Swinton, who in reality acts as the mouth-piece of the British Army in the field. "Armoured cars armed with maxims and light quick-firing guns," says "Eye Witness," "also have recently played a useful part on our side, especially in helping to eject the enemy lurking in villages and isolated buildings. Against such parties the combined action of the quick-firer against the snipers in buildings, and the maxim against them when the are driven into the open, is most efficacious."

Details of the armored motor cars in use are extremely hard to obtain, but this month we are able to give some relating to a powerful car that the Russian army is using. This formidable conveyance, which has been fitted with a 100-120 h.p. engine, has been designed to withstand rifle and machine gun fire; in fact, it is fitted with Vickers armor plating of the same thickness as that used in torpedo destroyers. The car carries nine men and two machine guns, one of which fires through an aperture in the heavily armored back doors, while the other is placed in the turret, and can bring the gun to bear in any direction. The men are entirely protected, even the apertures at the side for rifle fire, as will be seen from the side view of the car, being covered with slides, while the driver is effectively sheltered by the sloping shield in front, which need only be raised 1 in. even when the car is being driven "all out." Like all other vital parts, the radiator is covered with armor plating: indeed, the whole car is a young fortress on wheels; and its enormous power will enable it, not only to maintain a high speed, but to force its way through obstructions, the front of the car is being fitted with a wire cutting appliance. The car was designed, constructed, passed and highly approved by the commission of Russian officers in London, and delivered to Russia in record time.

The CCJ leads in circulation, advertising and prestige



Italian 'Buses Used to Feed Railways

A peculiar traffic condition exists in Italy, where all the railroads run in one direction, southeast and northwest. There are no cross railroads to feed these lines, and this has resulted in the establishment of a very large number of 'bus lines to act as feeders for the railroads. That shown on the left is an S. P. A., while the right is an electric 'bus with overhead trolley. These and the majority of Italian 'buses use Polack tires.

Factors of Truck Destruction

With the strong and almost stationary battle fronts that seem usual in Western Europe, the wastage broadly speaking, is due to other causes rather than shell fire. The roads have got into a terrible state and work an enormous amount of destruction.

In a war such as the present, however much transport either side had, it could not be enough. More transport would mean more possibilities, and there would then be a proportionate increase of demand on it. This heavy demand means long hours. On service every car of the British Army Service Corps is supposed to carry four men, a driver and his mate in two relays. I have spoken with some drivers who talk airily of 20 to 30 hours at the steering wheel, and this not as isolated cases, but often day by day. However accomplished the drivers may be, such utterly weary men can hardly be expected to run their cars to the best advantage. There is no doubt they get badly knocked about, and obviously there is little time available for overhauling them, but of these excessive war demands overloading must be reckoned as the chief factor of destruction.

One of the probable immediate results of this war will take the shape of bigger wheels, or at any rate increase the ground clearance. With the bad roads the low ground clearances have made themselves felt to an extent that people in days of peace certainly never realized as possible, and this too, before the rains of winter have hardly begun.

Motors to Fight Aircraft

The war seems bringing about an improvement in anti-aircraft equipment. At the beginning it was reasonably safe to fly at a height of 3000 ft., but now the Germans have brought out an anti-aircraft gun which firing shrapnel can reach æroplanes at a height of 9000 ft., and it is certainly not safe to fly at a height below 6000 ft.; indeed, more than one pilot flying at that height has experienced shrapnel bursting high above him.

Nor are the Allies standing still in the matter, and we are hearing a good deal more of the gun-carrying automobile designed some two or three years ago for the French by Captains Carsenat and Houberon of the French Artillery Technical Staff. This type of machine, which is illustrated, is really an adaptation of the wonderful 75 mm. French artillery, and the "auto-cannon," as it is called, comprises one of these pieces of the very latest type mounted on a 25-h.p. De Dion chassis, so that it can be fired in every direction—horizontal and vertical up to nearly 70° from the horizon. The details of the gun itself are, of course, not being exactly advertised by the French military authorities, who would only allow the machine to be photographed from one side, but whatever the details of its mechanism the gun is at least proving exceedingly valuable in the present struggle.

THE COMMERCIAL CAR IN INDIA

Reports are coming to hand that in certain parts of India increasing interest is being shown in the utility motor for short distance transport, in spite of the common belief in India that the bullock cart affords the cheapest possible form of transport. Recent experiments, indeed, have shown motor traction to a much cheaper means of meeting requirements than is generally supposed. For instance, in Bombay it is a common sight to see a string of thirty bullock carts each drawn by two oxen and loaded with three or four bales of cotton. Taking four bales as a maximum load, thirty men, thirty carts and sixty bullocks are then required to remove 120 bales, and it takes them 1 hour to cover 3 miles, the approximate cost working out to $8.75. The same number of bales can be carried by five motor wagons at a cost of $1.60 a car or $8.12 in all, and this in 15 minutes. This is assuming that an assistant is employed on each car in addition to the driver. I hear that a company has been formed to run a fleet of twenty to twenty-five motor lorries for the transport of heavy merchandise in Bombay.

This question of time is often a neglected factor in estimating comparative costs, but if the cars be worked as they should be, and are not kept standing about as capital lying idle, it is almost the most important of all; in nothing does time represent money more than in transport.

THE NEW PARIS AUTO 'BUS

Parisians are not likely to see their old auto 'buses again. Those (if any) that survive the terrific test of this war will be put on provincial service, and Paris is to enjoy the use of the latest word in motor 'bus construction. An example of the new design was recently on view in Paris, when it was carefully examined by M. Chassaigne-Goyan, President of the Manufacturers' Control Committee and his colleagues. The new vehicle though weighing very nearly 1400 lbs. less than the old, is somewhat roomier, and is provided with loftier windows, which however, only open on one side.

WILL NOT GO BACK TO HORSE TRACTION

Signs are not wanting that the requisitioning of horses for military purposes is already beginning to tell its tale. A typical case is afforded in England by the Stratford Co-operative Society at whose last quarterly meeting the president announced that forty of their horses had been requisitioned. They already possess about a dozen motor vehicles, and, therefore, propose to extend their garage accommodation, as they have quite made up their minds not to go back to horse traction.

The truck will enable the mediocre man to accomplish more than others of much greater ability

The CCJ is the only truck journal a member of the Audit Bureau of Circulation—Why?

TRUCKS IN INTERCITY WORK

By C. F. BARRETT

IN interesting example of the possibilities of intercity motor trucking in competition with a parallel railroad line is afforded by the system which has been developed by the New York & Hartford Despatch Company, of Hartford, Conn., now in its second year of successful operation. The actual name of this concern is misleading, as it was found shortly after beginning the work that the New York City business could not be arranged satisfactorily on account of an established company doing the same line of work in this section. Springfield and Boston connections were, therefore, made instead.

At the beginning of this company's operations in 1912, a very heavy trade was already waiting for it between Hartford and Springfield, owing to the differences existing between these two cities on Western express matter. Before the Interstate Commerce Commission divided the country up into zones, the express rate was 50 cents a hundred less between Springfield and Western points than from Hartford, although the two cities were practically the same distance from such points. It was, therefore, cheaper for Hartford merchants to send their Western express matter by the motor truck despatch to Springfield than direct, the motor charge being only 40 cents a hundred. Furthermore, there was a saving in time of from 24 to 26 hours in favor of shipping via Springfield by motor truck. Since February 1, 1913, however, when the Hartford and Springfield Western rates were substantially equalized, the company has been forced to secure its business on a more direct competitive basis with the express companies.

The two cities are approximately 25 miles apart and are connected by a fine hard road with few grades, making an ideal route for motor truck operation. Large tobacco farms and several important industries are located along the way, giving considerable local business in addition to the through freight.

Two five-ton trucks are used by this company and a rebuilt touring car chassis fitted with light delivery body. One truck does local picking-up and delivery work around Hartford, while the other is used almost exclusively on the Springfield trip. The lighter vehicle is also used for picking-up and delivery work locally and on specials.

A careful schedule has been worked out which affords the shippers of both cities an unusually satisfactory delivery system. The Springfield truck leaves the central collecting station, located near the railroad depot, at seven o'clock every evening, making the run up to Springfield in from 2½ to 3 hours. It leaves its load at the distributing station in the latter city and returns at once to Hartford with south bound freight, the latter having already been collected and placed ready for quick loading from the platform by a local express company. In addition to these night trips, the same truck makes three trips a week to Springfield in the daytime to bring down meat shipments from a packing house. In the meantime, the other five-ton truck and the light delivery vehicle have been delivering and collecting in Hartford, doing the former in the morning and the latter in the afternoon. Thus the local merchants in each city receive a very prompt, early delivery and a late shipment.

The actual saving in cost of shipping by the motor truck despatch over the regular express amounts to 10 cents a hundred between Hartford and Springfield points with the added advantage in favor of the motor trucking companies of more prompt deliveries and less danger of damage to fragile material.

Aside from its Springfield trade, this concern has also built up a successful business of collection and delivery by motor truck for fast freight to and from Boston. The freight leaves Hartford at 5 p.m. and cars are ready for unloading in Boston, 125 miles distant, the next morning. This arrangement also makes it possible for Hartford merchants to stock up quickly from Boston wholesale houses, as the return fast freight arrives in Hartford in season to afford prompt delivery by the motor trucks. If a certain store in Hartford is short of a special line of goods it can wire Boston for them and receive them the next day in season to deliver to a customer.

As regards the cost of operation of its motor trucks, this company has found that it costs about $12 to $13 for each round trip to Springfield, the total mileage of which averages about 55. Nearly 15 gallons of gasoline are consumed and about 1½ pints of oil on each trip, making an average of approximately 3 6-10 miles per gallon of gasoline and 280 to 300 miles per gallon of oil.

The company has had an interesting experience in relative tire economy with steel and wood-spoke wheels respectively. With the former it secured a total of 13,000 miles on the rear dual tires with one of the five-ton trucks. As the spokes nearly all cracked, however, it was necessary to replace them with wood wheels and on the latter the same size tires gave only about 7500 miles. The total tonnage in each case was approximately the same, although somewhat less with the wood-spoke wheels than with the steel wheels. The experience of this concern proves that there is an unquestioned tire economy due to the use of steel wheels, but the latter will not stand the severe road shocks even on a comparatively smooth road bed such as encountered on this company's Springfield route. The difference was too great to be attributed to any effect due to the make of tires themselves and must have been largely due to the heat radiating feature of the all-steel wheels, which prevented rapid internal disintegration of the tires.

Several special lines have been developed by this despatch company in addition to its regular business, which show the possibilities of increasing the earning capacity of small motor trucking concerns of this character. This is accomplished in two ways; by hauling special loads for various manufacturers and merchants and by chartering the trucks for picnic outings, excursions, etc. For the latter purpose a neat form of upholstered seat made in sections has been devised which can be readily inserted along the sides and front of the body, the change taking only a few minutes.

Considerable skill is required in arranging the drivers' hours so that these trips can be sandwiched in, but the men have been taught the military principles of constant readiness and willingness to co-operate toward the best interests of the company. They have been carefully selected and each one has been taught to feel a personal responsibility for the welfare of the concern, so that he takes his turn without grumbling. The net result of this spirit among the drivers is that the company's property and that of its customers are carefully handled, accidents are exceedingly rare and each vehicle receives proper care and attention. The men make all the minor repairs necessary on their trucks and keep the machines tuned up to the highest efficiency at all times, there being sufficient spare time provided between trips for this purpose.

The experience of this concern proves that a good driver-mechanic will more than make up the difference in his wages over a lower grade operator by the saving in the wear and tear on the expensive investment in his care. We doubt if any better system for solving the driver problem has ever been devised for small motor trucking concerns than the one adopted by this concern of using first-class driver-mechanics, of careful selection and training them thoroughly into the realization of a strong personal responsibility for the company's welfare and property.

A Two-Ton Wichita Truck Moving a Building a Distance of One and a Half Miles Through the Suburbs of Fort Worth, Tex.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

The New Three-Quarter Ton Republic

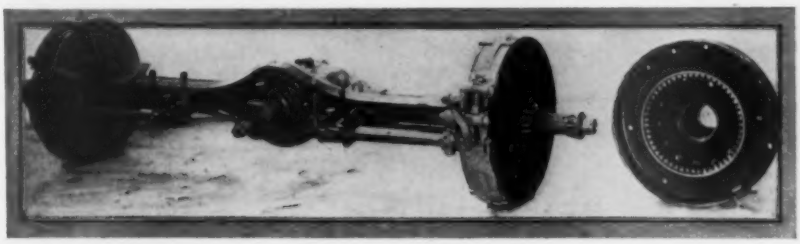
THE Republic three-quarter ton truck is a finished product after 18 months of careful analysis of the requirements of light haulage problems throughout the entire country. This thorough investigation has led the Republic Motor Truck Company, of Alma, Mich., to believe that there will be but one universal size and character of truck for light hauling.

The company's effort has been to produce a truck which can be properly styled "standard." To do this it was necessary to produce a car for every business, equal to every emergency, refined, quiet, positive and at a price ($995 with express body) in keeping with the cost of doing business.

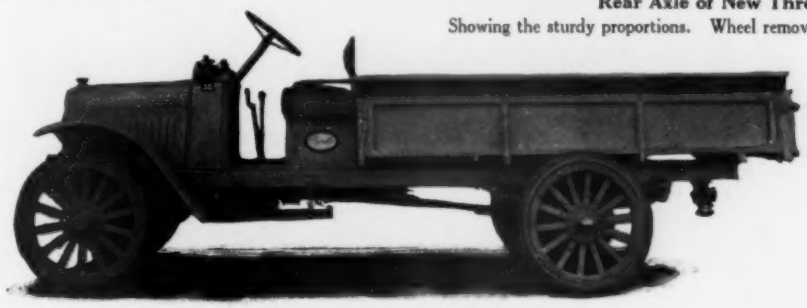
After careful and exhaustive rear axle experiments under all conditions, from the heaviest of clay roads to pavements, the internal gear drive design of rear axle construction was decided upon.

The motor is a long stroke, four-cylinder, 3½x5 in. Continental. It is L-head, en bloc type, with interchangeable valves, three-bearing crank shaft, constant oil level maintained by plunger pump and thermo-syphon cooling with a vertical flat tube radiator.

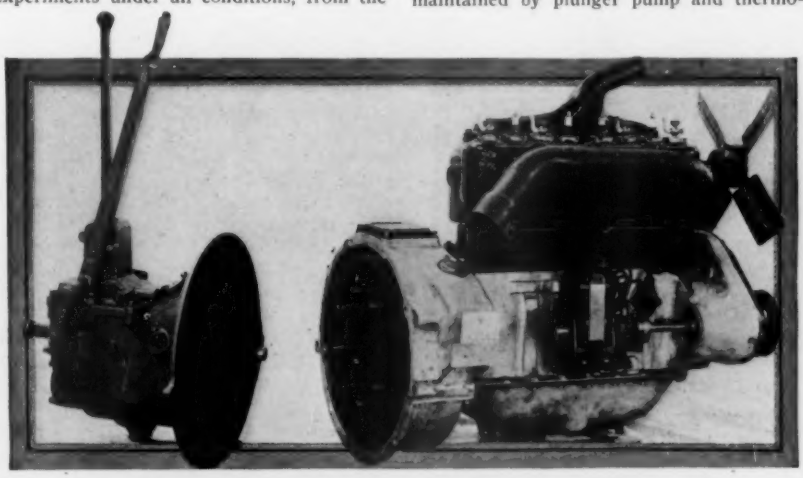
Clutch is a 12-plate disc. The selective transmission gives three speeds forward and one reverse, having heat treated nickel



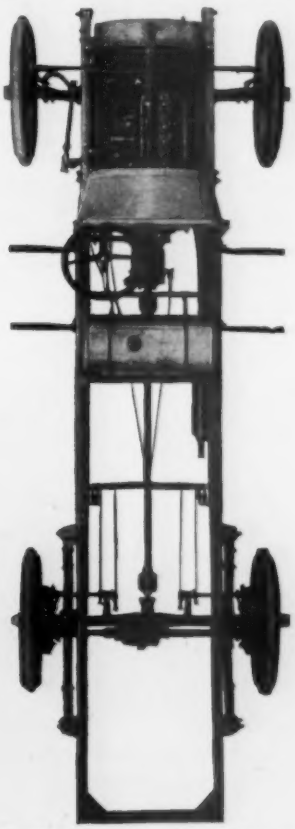
Rear Axle of New Three-Quarter Ton Republic
Showing the sturdy proportions. Wheel removed, showing driving pinion and gear, bearings, etc



The New Republic Three-Quarter Ton Model
Featuring an internal gear drive rear axle. Furnished as above, $995



Power Plant of New Three-Quarter Ton Republic
Four-cylinder, en bloc, Continental, 3½ x 5 in. motor; disc clutch; three-speed transmission



The New Republic Three-Quarter Ton Model
Plan view of chassis, showing the neat arrangement of the units. Note the internal gear drive rear axle

The CCJ has most readers because it gives most information

alloy steel gears of 7/8 in. face. Center control with lever operating in ball socket joint.

Drive is through 2 in. tubular shaft with Hartford joints to the internal gear rear axle with a 6½ to 1 ratio. Front axle is drop forged with roller bearings for wheels.

Wheels are artillery type, fourteen 1¾ in. spokes front and rear. Standard tires are Firestone 35x3 in. front, 3½ in. rear, 35x5 in. pneumatics being $50 extra. Both brakes operate on rear wheels, service being 15x2 in. external contracting and emergency; 14x2½ in. internal expanding.

Front springs are semi-elliptic, 38 in. long, rear semi-elliptic, 48 in. long. They are heat treated, oil tempered and self-lubricating. Frame is pressed steel, channel section, 4½ in. deep, side member 3-16 in. stock.

Steering gear is worm and split nut with 18 in. wheel and on the left side. Wheelbase is 124 in. with 56 in. tread. Gasoline capacity 12 gal. Equipment comprises three oil lamps, horn, tools and tool box.

Saxon Brings Out a Delivery Car

The Saxon Motor Company, Detroit, Mich., has decided to market a light delivery car of 400 lbs. carrying capacity priced at $395. This new delivery car has such features of standard design as a powerful four-cylinder motor, sliding gear transmission, dry plate clutch, shaft drive and standard tread. The top of the body is fitted with storm curtains which may be lowered so as to protect the load in inclement weather. The loading platform is low, making it convenient for the driver to handle goods.

Motor

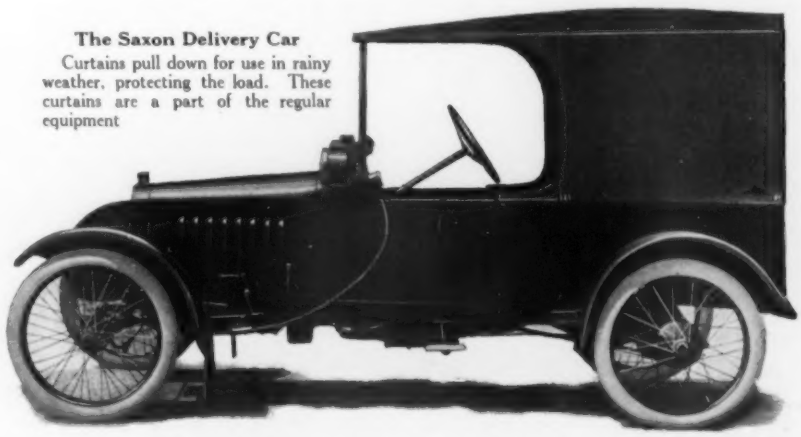
The Saxon motor is of the L-head type with fully enclosed valves. Cylinders are 2⅝ in. bore by 4 in. stroke. The four cylinders and the crank case are made in one casting, giving a very compact motor and making possible great economies in manufacture. The intake and exhause manifolds are cast integral with the cylinders. A water-jacketed head, fitting over the entire cylinder block, is easily removable and gives ready access to the cylinders and valves.

Pistons are very light but exceptionally strong. This lightness in the reciprocating parts makes this motor practically free from vibration.

The crank shaft is of special drop-forged steel, of unusual size, and is carried on two bronze, babbitt-lined bearings. The cam shaft is also of drop-forged special steel with large cams forged integral. The cam shaft is carried on two plain bearings and driven by helical gears.

Transmision

The sliding gear progressive type transmission gives two forward speeds and reverse. The use of this type of transmission and its location on the rear axle eliminate a number of pieces in the shifting mechanism —another feature of design making for economy in the building of the car. The clutch is Raybestos lined, dry plate, five-disc type.



The Saxon Delivery Car

Curtains pull down for use in rainy weather, protecting the load. These curtains are a part of the regular equipment

Brakes

Both service and emergency brakes are located on the rear wheel hubs. The service brake is of the contracting type, 8 in. in diameter, lined with heat-proof material. The emergency brake is of the internal expanding type, Raybestos on steel, 7 11-16 in. in diameter. Both brakes are 1¼ in. face.

Lubrication

The motor is lubricated by the vacuum splash oiling system. Oil is circulated and held at a constant level without a single moving part, thus securing utmost simplicity and economy through the elimination of the oil pump and its connections. A Mayer carburetor is used.

Ignition

Ignition is supplied by the Atwater-Kent system with six dry cells. Experience has shown that these six dry cells will last for the entire season without renewal.

The Saxon axles, both front and rear, are of the same type of construction as used on large trucks. The front axle is a single-piece drop forging, I-beam section. The steering spindles are carried on plain bearings. The rear axle is of the semi-floating type, with pressed steel housing. The live axles and drive shaft are high grade, heat-treated steel. The outer end of the drive shaft is carried on Hyatt roller bearings. The differential is of the two-pinion, plain-bearing type.

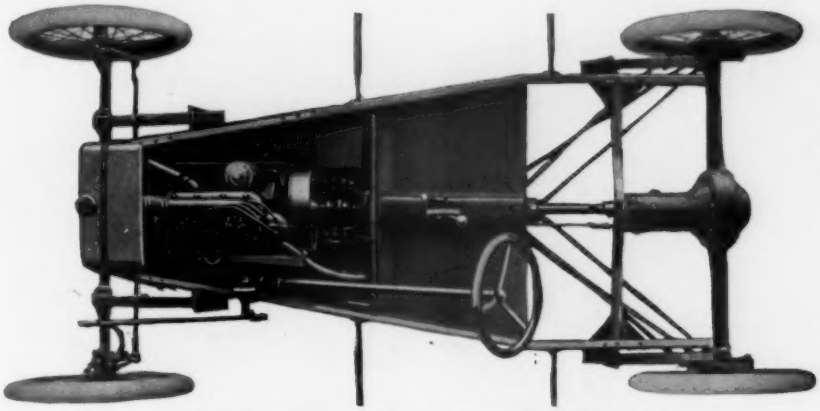
Control

The Saxon delivery car has left side drive with gear shift and emergency brake levers in the center, permitting entrance

Three-Quarter Rear View of Saxon Delivery Car Partially Loaded

Note the generous loading space, providing easy accommodation for 400 lbs. besides the driver. This car has just been announced by the Saxon Motor Company, at a price of $395

The CCJ has most advertisers because it gives them biggest returns



Top View of Saxon Light Delivery Car Chassis
Showing disposition of various mechanical components. Note the peculiar shape of frame

from either side of the car. The clutch and service brakes are controlled by separate pedals, placed in a convenient position. The throttle is controlled entirely by the foot accelerator, which is so constructed and situated that it does not tire the foot. The spark lever is on the dash, thus leaving the 16-in. steering wheel entirely free from levers.

The Saxon spring suspension is of the cantilever type. By this method the body is suspended between the axles rather than over them, permitting the use of a longer wheelbase than would be possible with other types of springs.

Commerce Supplants Friction With Shaft Drive and Sliding Gears

THE season of 1915 marks the discontinuance of the friction drive in favor of a shaft drive with a selective, sliding gear, three speed transmission by the Commerce Motor Car Company, of Detroit, Mich. The new series S is of 1500 lbs. capacity, selling at $975 in panel, express and express with top and curtains types of bodies.

Motor

This 3½x5 in. four-cylinder monobloc engine, is designed for continuous hard work. The valves are interchangeable, mechanically operated by cam shaft and are enclosed by two removable dust-cover plates. The motor has three large crank shaft bearings. Cam shaft is one-piece, drop-forged, the cams being integral with shaft. The crank, cam and connecting rod bearings are made of highest grade of nickel babbitt.

The motor is lubricated by a horizontal plunger pump, as well as splash. Constant oil level is maintained for splash lubrication of piston, connecting rods and crankshaft bearings. Eisemann high tension magneto is used.

Transmission and Clutch

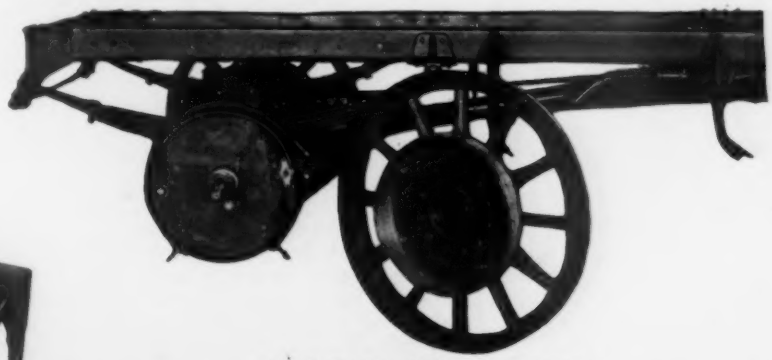
The transmission being bolted to motor, it is protected from vibration, side motion and twisting stresses. It is of the selective sliding gear type with three speeds forward and reverse. All gears are nickel alloy, ¾ in. face, and run in a constant bath of oil. Double row ball bearings are used as main bearings.

The gear shaft mechanism has an interlocking as well as mesh lock. The control is central, the shift lever, which acts in ball and socket joint, being drop forged.

The clutch is the cone type, leather faced, with spring pads under leather to prevent grabbing. Very simple and efficient.

Rear Axle

The rear axle, designed to carry 1 ton, is of the three-quarters floating type. Wheels are carried on Hyatt bearings. Simplicity dominates the construction of the rear axle. The axle shafts may be entirely removed without disconnecting either the brake rods or springs, in fact the whole housing of the axle, including the brakes, may be left on the car, and every other working part removed. The differential has a ratio of 6 to 1 and is exceptionally well adapted for the service. It is easily inspected or removed by merely unscrewing a few bolts. The adjustment is simple. The axles are of 1⅜ in. chrome vanadium steel, heat-treated, and squared into differential.



Ample Brakes of New Commerce
Two sets, service being external contracting on 15 x 2 in. drums; emergency, internal expanding 14 x 2 in.

Commerce Model S-H.
Stake body with canopy top, side and rear curtains and tailgate. Accessible from all sides, yet fully protected from the weather

Brakes, Springs and Frame

Two sets of brakes are provided, enabling operators to drive on grades and in traffic with perfect control. The service or foot lever brakes are external contracting on steel drums, lining to metal, 15 in. diameter by 2 in. face. The emergency or hand lever brakes are 14 in. diameter by 2 in. face, internal expanding, lining to metal.

The CCJ leads in circulation, advertising and prestige

Commerce Model S-C.

Panel top, with rear door or tailgate optional. Bevel-glass windows at seat and on rear doors. Storm curtains front and on rear of tailgate body. Price, $975

Wheels are artillery wood with 1½ in. diameter spokes, twelve to each wheel. Tires are 33x4½ in. Q. D. pneumatics.

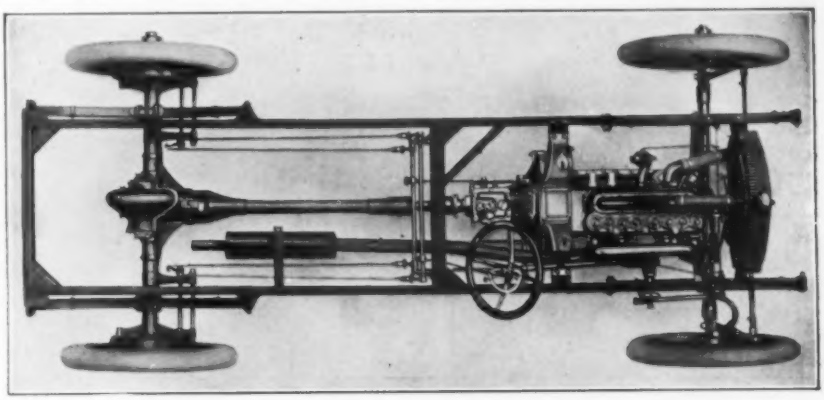
Springs are semi-elliptic, heat treated and oil tempered. Front are 36 in., rear 42 in.

Frame is channel section pressed steel, 3-16 in. stock in side and cross members. A worm and split nut steering gear with 16 in. hand wheel is furnished either right or left side drive.

Wheelbase is 107 in., tread 56 in., gasoline tank 10 gal. capacity. Equipment includes three oil lamps, horn, tools and box, pump, tire repair outfit, windshield and jack.

FEDERAL UNIT BODIES

Realizing that every business is individual and has conditions and requirements peculiar to itself, and that this has made it impossible to produce a single body perfectly adapted to every line of business, the Federal Motor Truck Company, of Detroit, Mich., has been building its bodies on the unit system. This has given bodies suited to the conditions, at the same time of lower cost than had it been necessary to build a special body. By this system also the truck owner is assured that well seasoned wood is used, with the proper forgings.



Plan View of Commerce Chassis

Note finned, cast radiator; strong, clean-cut lines, and absence of complexity. The pressed-steel frame channels are 3-16 in. material, amply cross braced and yet flexible

By the Federal system the bodies are also as light as is consistent with the necessary strength, skid strips are provided to protect the flooring, and stake pockets are unusually deep to prevent rattling, and hold the stakes in alignment. The units are interchangeable, so that no fitting is required.

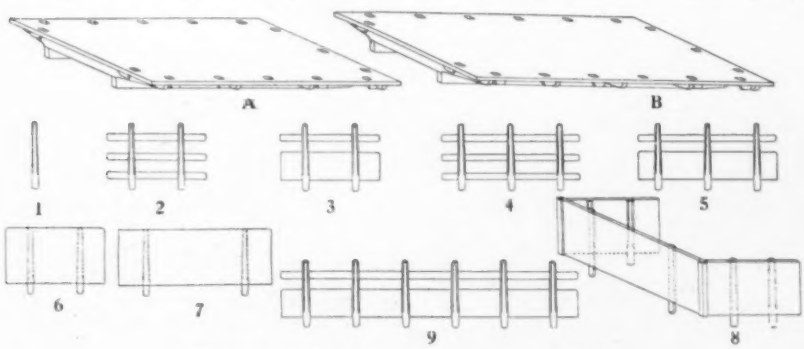


Diagram of the Units of Federal Stake Bodies

The floor is composed of A or B. By a proper combination of the other units, an inexpensive body can be obtained to suit a number of businesses. For other bodies, the standard express body with flareboards, is taken as the base. On it can be attached a roof, curtains, screens, etc., giving the body best adapted to the conditions.

As a basis for this series of bodies, the company uses a standard stake platform, and a standard open express body with flare boards for each length of chassis. The stake body units are shown as A and B in the accompanying diagram. An express body is too well known to require illustration. A large number of bodies can be built on these basic units, by using the various stake units listed for stake bodies, and the top and screen for the express bodies.

As an example of the use of this system, suppose a body on the long wheelbase chassis is desired for carrying small packages, loading and unloading to be done from the side. An excellent body for this purpose is obtained by the use of two number 8's—one at the front and the other at the rear, and one number 3 in the middle of each side. This gives a fixed bulkhead at each end, with an easily removable piece at each side for loading and unloading. Should a flush side body be desired, two number 6's could be used, or if barrels or boxes were to be carried a number 1 unit would be employed, completing the sides with single stakes. In case only letter boards were required, a very handy body could be made by using two number 6's at the front of the body at either side of the seat. The body could then be completed by the use of four number 3's and one number 5.

The price of the first body in the above examples would be obtained by adding that of one unit B, $115, two number 3's, $7.80, and two number 8's, $34.50, giving a total price of the body of $157.30.

The stake bodies are all built on the A and B units, giving bodies of 8 ft. 6 in. x 60 in. and 10 ft. 6 in. x 60 in. inside measurements, respectively, for short and long wheelbase trucks. Standard stake bodies list at $125 and $150 for the two lengths.

Express bodies are 8 ft. 6 in. x 48 in. and 10 ft. 6 in. x 48 in. inside measurements for the short and long wheelbases. The sides of the bodies are 14 in. high, with 7 in. flare board. The tops and screens are mounted on the flare boards, being securely fastened at six points, so as to give a very rigid top. Screens are very easily removable, so that the body can be used with or without screens as necessary. The top is also easily removable.

The CCJ is the only truck journal a member of the Audit Bureau of Circulation—Why?

DO'S FOR THE DEALERS

Do your best when approaching a prospective buyer to gain his confidence.

Then do your best to hold his confidence, for when you hold his confidence you will hold his trade.

Always tell your customer the truth when making a sale and you will never have to crawl from a tight situation.

Give your customer the facts concerning the truck you are trying to sell to him without embellishing or exaggerating.

Let your prospective buyer understand that there are other makes of cars, if he wishes to, but show him where the car you are handling is best for his particular needs.

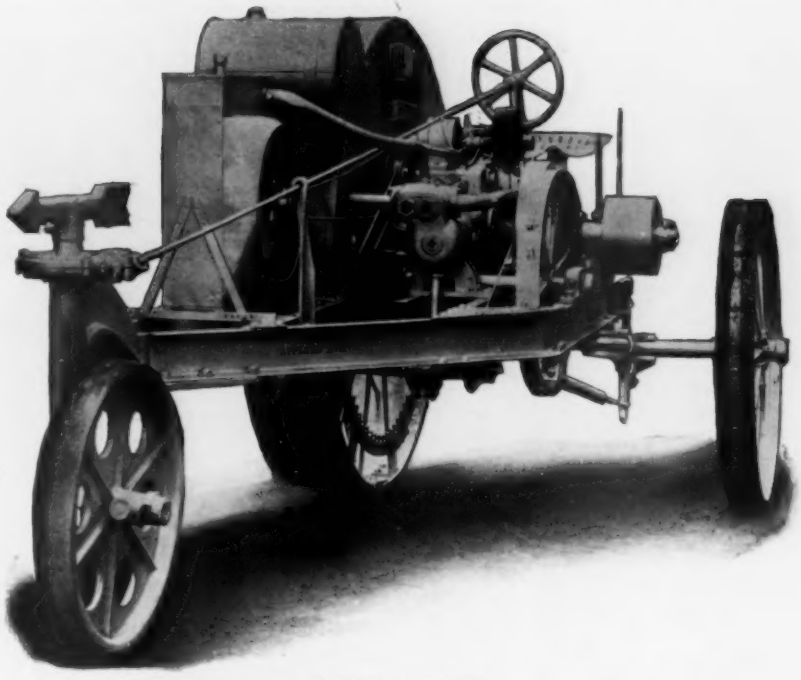
If your customer goes elsewhere and buys a different make of truck, keep after him the harder to make sure his next purchase will be the truck you are handling.

Remember that your competitors have as much right in your city as you have, and that they are apt to treat you in the same manner as you treat them.

When your prospective customer mentions the name of a truck your competitor up the street is selling, speak well of the dealer and his truck, but show him the superiority of your truck without "knocking."

BIG FIRMS BUYING FOR ECONOMY

The agent for a well-known medium-weight, medium-capacity, medium-priced truck, predicts that during the next few months there will be a very good business in trucks of this class. Business men generally received a severe shock when the war broke out, but American bankers are demonstrating their ability to take care of the situation, and it is becoming evident that while conservatism is necessary, there is money enough in the country to continue business on a fairly good scale of activity. People who have the money will buy trucks for economy. This agent recently sold eight trucks to a telephone company to replace horses. They knew from experience they could make an operating saving of 20 per cent. on the money they put into the trucks, and big firms like this always have the money for an economy of this sort. The next few months will be the best yet, in this agent's opinion.



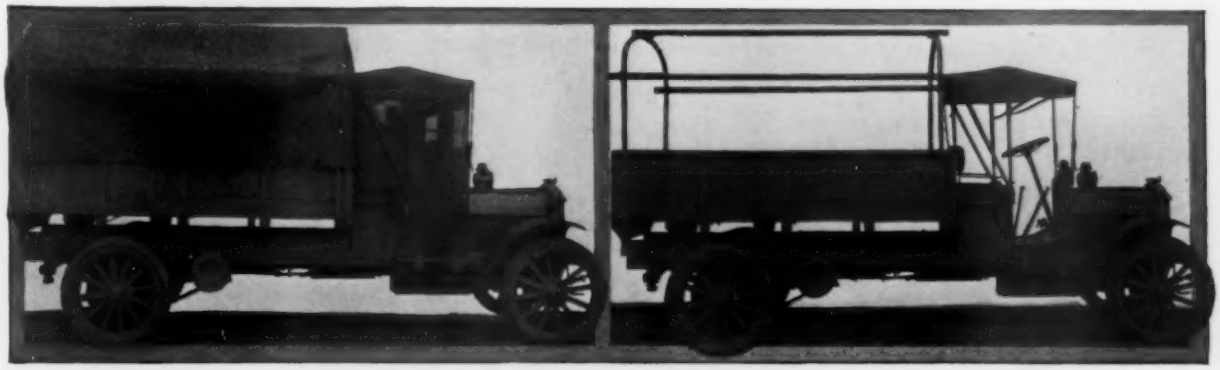
Bull Tractor, $395

Single bull wheel and gear with only five gears, including the reverse gear. No transmission; cone clutch. Two-cylinder, four-cycle opposed, 4¾ x 6½ in. motor, delivering 5 h.p. at draw bar and 12 h.p. on belt. Besides drawing plows, etc., it can also be used as a stationary power plant for sawing wood, etc.

One of the things owners will have to learn to do is to prevent overspeeding. This dealer thinks the truck manufacturers and salesmen themselves are responsible for a good deal of overspeeding. He cites a case where a so-called endurance run was made, but says it was not an endurance run at all, but a race. The drivers, under sanction of the dealers, speeded up to 25 to 35 m.p.h. throughout the run, over all kinds of road conditions, and then bragged about it in the newspapers, leading owners and drivers of trucks in commercial service to wish to emulate their bad example.

There is less tendency now than there was two years or so ago to buy a truck too large for the requirements. At that time owners figured that they would rather be safe, and were replacing two one-ton wagons with one two-ton truck, figuring that it was equivalent, but omitting to give proper weight to the increased speed and consequent saving of time which comes with the motor truck.

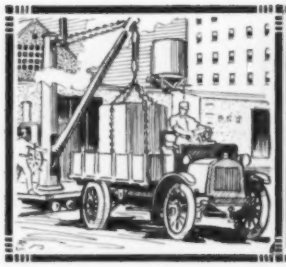
The purchasing agent was hired because in the first letter he wrote he said:—"All the buying I do is done as if I were buying for *myself*."



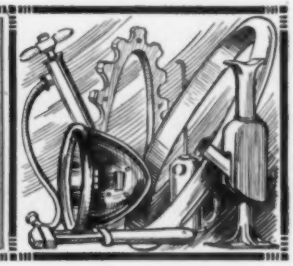
A Special Two-Ton Federal With and Without Tarpaulin

Equipped with removable tarpaulin top. Sides of the body and end gates are also removable. This body is the design most favored by army officers, as it enables many varied uses of the truck, enables them to meet with practically all requirements conveniently. Body does not overhang chassis. It has 144 in. wheelbase, 3 in. dual rear tires, 112 in. length of body, 58 in. wide, 60 in. high, and 24 in. panels.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers



TRUCK ACCESSORIES AND APPLIANCES



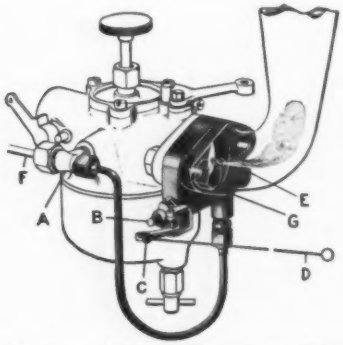
THE "DON'T WORRY" GASOLINE VALVE

The Detroit Accessory Company, 870 Woodward Avenue, Detroit, Mich., is marketing a very simple device which prevents the annoyance of "running" out of gasoline on the road. It consists of a valve which has two outlets and when applied to the gasoline tank outlet, provides a method whereby a reserve supply can be maintained in the gasoline tank.

"Don't Worry" Gasoline Valve

For ordinary running the valve is placed in such a position that the gasoline leaves the tank through the upper opening of the valve. As soon as the gasoline reaches this level and the motor begins to "miss" the valve is turned to allow the rest of the gasoline to drain into the carburetor.

The usual installation is between the tank and the sediment cup. A controlling handle projects through the heel board into the driver's compartment, facilitating manipulation.

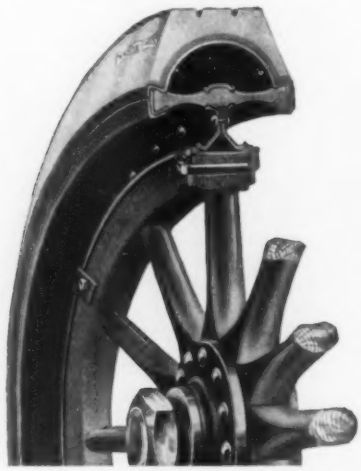


Application of Flange Type Injex Primer

Flange type supplied for 1⅛, 1¼ and 1½ in. carburetors. Also furnished in manifold type fitting any size.

THE TENSION TIRE

To give as little vibration to the car, to deliver as much power to the road wheels as the regular pneumatic tire, but also to eliminate the annoyances of punctures, blow-outs, etc., is the purpose of a tire built upon a new principle by the Tension Tire Company, Land Title Building, Philadelphia, Pa., and known as the Tension tire. A noteworthy fact is that, when this tire is applied to a wheel fitted for regular demountable rims, no change in the wheel is necessitated, while the tire that is fitted has the same extreme diameter as the one which it replaces, thus necessitating no change in the speedometer mechanism to give a true indication. For example, when this tire replaces a 34x4 tire, or any other size, the new tire's diameter is 34 in. or the diameter of the old tire.



Cut-Away Section of Wheel with Tension Tire in Place

The accompanying illustration will make the construction clear. The wheel itself is suspended on a diaphragm, or web of rubber stretched taut across the U of the Tension tread ring, the road shocks being absorbed in this rubber diaphragm.

THE INJEX PRIMER

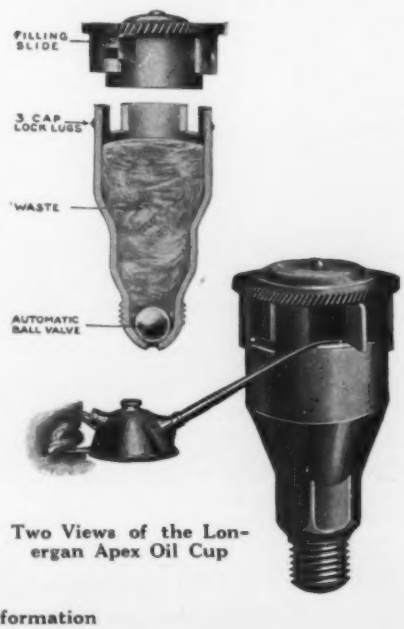
The purpose of this device is to furnish a method of priming without the use of priming plugs. It is small, can be installed in 30 minutes and is furnished in two types: manifold type, which can be applied at any point on the manifold of any car, and flange type, which is applied between the carburetor and manifold. Furnished in three sizes to fit 1⅛, 1¼ and 1½ in. carburetors.

The device can be operated from dash or radiator. The Reflex Ignition Company, 211 High Avenue, Cleveland, Ohio., is the exclusive sales agent in the United States and Canada, and the Shimpf Starter Company, of Boston, is the patentee and manufacturer. The price is $2.50, which includes all fittings.

THE LONERGAN APEX OIL CUP

A new idea in the lubrication of spring shackle bolts, steering gears, etc., is shown in a new oil cup of the J. E. Lonergan Company, 211 Race Street, Philadelphia, Pa. It comprises an oil cup, which is easily filled by simply turning the cap to filling position and injecting the oil, without any soiling of clothing. As shown in the sectional view, the cup is filled with waste, the amount in a proportion to the duty to be performed. At the lower end of the shank is a ball which allows lubrication only when the car is in motion. The cup is always carried in a vertical position, elbow couplings being supplied where regular connection is horizontal.

The cup is furnished in two sizes: No. 1, with a capacity of ⅛ oz., ⅞ in. outside diameter, 1½ in. high, and ⅛ in I. P. connection; and No. 2 with a capacity of ¼ oz., 1 3-16 in. outside diameter, 2 in. high and ⅛ in. I. P. connection. The first lists at $.50, $.60 and $.70 in dull brass, finished brass and nickel plated, the second at $.60, $.70 and $.80. Elbows are $.30 each.



Two Views of the Lonergan Apex Oil Cup

STEELE'S SPEED-LIMIT CONTROL

To prevent the expense resultant from operating commercial cars at excessive speeds but yet not to hinder the motor in any way within the limit of speed set is the purpose of this device. It accomplishes this by cutting out the spark when the predetermined speed is reached, but it does not interfere with the operator's control of the throttle in any way or reduce the power of the motor. The engine simply fails to fire above the limit and cannot run any faster.

It also prevents motor racing when in low speeds or when clutch is suddenly thrown out with open throttle. The instrument has a tachometer dial showing the number of revolutions per minute of the motor. By noting this, the driver can secure the most efficient speed when taking grades or on other heavy work, and he can drive at a more uniform speed, thus avoiding stalling in traffic work. Economy in gasoline is also claimed.

The governor can easily be set at any desired speed. It is driven by a spiral gear

Steele's Speed-Limit Control

Cuts out the ignition when motor reaches a predetermined speed, but does not affect motor before that speed is reached.

attached to magneto or pump shaft, connection between gearing and instrument being a music wire flexible shaft. It is impossible to tamper with the instrument except by cutting the cable or electric connections, there being only one wire leading from the instrument to the primary circuit.

The device is marketed by W. M. Steele, 98-100 Beacon Avenue, Worcester, Mass.

THE PARKIN CARBURETOR

Some novel features are contained in the Parkin carburetor of the Light Manufacturing and Foundry Company, Pottstown, Pa. For this careburetor are claimed greater mileage to the gallon of fuel, less carbon deposit, better idling, a better mixture and an advance in power for every opening of the throttle without any skipping or flat spots.

By referring to the accompanying sectional illustration, it will be seen that the gasoline first passes through a wire screen and then up to a very good type of float action. It passes from the float chamber through a horizontal tube and then up through the jet, the opening of the jet being a single orifice on one side. Closely tele-

Exterior of Parkin Carburetor

Note the adjustable arm secured to the throttle by the set screw. Moving the arm in relation to the throttle causes the jet controlling cap to be moved by the eccentric on the throttle axis.

scoping the jet is a cap which is pushed downwards by an eccentric on the axis of the revolving cylindrical throttle and is returned by a spring. This cap controls the opening of the jet. Surrounding the cap and extending below the jet orifice is a tube with a slight space between it and the jet. This tube is one with the top of the cap which controls the jet size and, consequently, moves with it. This outer tube has a series of minute perforations extending around it. Part of the incoming air goes up between the jet and the tube and mixing with the gasoline emerging from the jet orifice, passes with it through the perforations of the outer tube on the principle of a Bunsen burner. Here it combines with inrushing air and, forming a mixture, passes with it through the bore of the cylindrical throttle to the engine.

The mesh of the wire strainer is smaller than any subsequent aperture, thus no clogging can occur. In addition, the sliding regulator would dislodge any particles which might collect at the jet. The trap underneath the strainer can be readily removed for cleaning. The jet also is easily removable, as shown.

Just to the right of jet can be seen a regulating plug to control the amount of air. At the top of the throttle can be seen (the light section) the small opening which is used for throttling.

In the exterior view is shown an arc, concentric with the throttle lever and secured to it. By loosening the screw, the arc can be moved, thus changing the relation of throttle to the eccentric controlling the jet opening. This provides for adjustment of the size of the nozzle.

Price varies from $18 for the ¾ in. size to $60 in the 2 in. size.

NEW METHOD OF REPAIRING SCORED CYLINDERS

A process to greatly reduce expense in repairing scored cylinders has been patented by L. Lawrence & Company, 294 Halsey Street, Newark, N. J. By this new method shallow or deep scores are filled with a silver composition by means of electricity and the composition smoothed down to the face of the cylinder walls. No heat affects the cylinder during this operation. The same piston and rings are used. The composition is said to have unusual wear resisting qualities and to not melt or chip away under extreme heat.

NEW KRAMER GOVERNOR MODEL B

This device, the first model of which was described in our columns a year ago, is now being brought out in improved form, known as model B. The new model is substantially the same in principle, the difference over the former model consisting of constructional refinements only. Instead of using a cylindrical throttle, a plain disc throttle is used in the bottom of the governor, thereby

Cut-Away Section of Parkin Carburetor

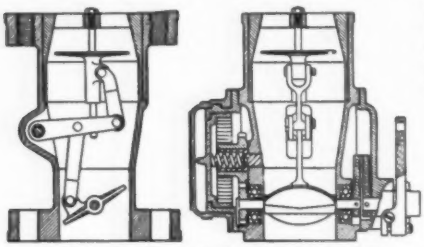
Reference to the text will fully explain the operation

The CCJ has most advertisers because it gives them biggest returns

taking up less space and reducing the number of moving parts to a minimum.

This governor regulates the speed of the motor and is a self-contained unit, which has no connections to any moving part of the engine.

The speed of the ingoing gases is utilized as the motive power for operating the disc or control member, which floats in the path of the gas. This disc is, therefore, subjected



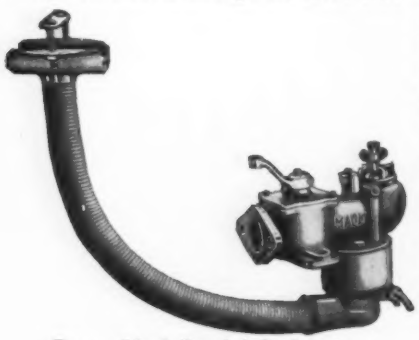
Sectional Views of the New Model B Kramer Governor

instantaneously to any changes in the speed of the gases which in turn, are dependent upon the engine speeds. As this controlling member is operated entirely by the gases the action of the governor is instantaneous, and the throttle which is connected to the operating disc is opened upon application of additional loads, at the psychological time and speed.

The throttle is kept under a predetermined tension by the action of a clock spring which is enclosed in a case locked by a Yale padlock. All governors are set for a maximum speed of about 1000 r.p.m. at the factory, although this setting can be changed if desired. The Kramer governor is made by the Kramer Governor Company, Detroit, Mich., in three sizes.

NEW BREEZE TWO-FUEL VALVE AND SPECIAL MACK CARBURETOR

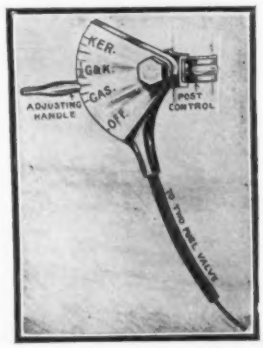
Two new accessories are being marketed by the Breeze Carburetor Company, 250 South Street, Newark, N. J. The first is known as a two-fuel valve or kerosene adapter valve. This can be applied to any carburetor, allowing the use of kerosene with the present carburetor. It is adjustable from the seat, as shown by the illustration, so the proper mixture of kerosene and gasoline feeds through the carburetor.

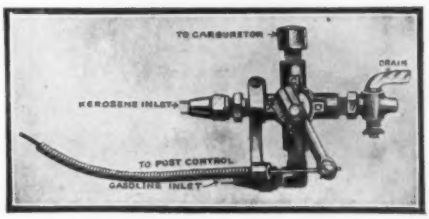


Breeze Mack Special Carburetor

Any two fuels can be used, but "kerosene" and "gasoline" were placed on the post control because they will probably be most employed. The two can be mixed in any exact percentage that you want and works successfully. Either fuel can be used when desired. With 5 ft. of monocoil control, the price is $5.

The other is a special carburetor for the large Mack or International truck. It is an easy starting type with self-priming top and elbow. Cylinder throttle section is flanged on the bottom for bolting to support or subframe. The throttle stem has a double bearing to prevent wear. All parts are the same





Steering-Post Control and Lower Part of Breeze Kerosene Adapter

as Breeze 1½-in. Model "H," except throttle parts. Size is 1½ in., with gaskets and special Mack connecting plug, with hot-air outfit, $25 complete. Without hot-air outfit, $22. Exchange price, returning old carburetor prepaid, $12.50.

THE HIPCOSCOPE

The Hipwell Manufacturing Company, of North Side, Pittsburgh, Pa., has brought out an entirely new type of flashlight which it is marketing under the name of the Hipcoscope. While not unlike the conventional type of flashlight in external appearance, the Hipcoscope embodies a radical change in its method of light projection. Two high power magnifying lenses, rigidly adjusted to an exact focus with a true parabolic reflector, concentrate and intensify the light. A range of 200 ft. is obtainable. The Hipcoscope requires no more current than the usual flashlight and uses the standard size miniature dry cells in connection with a G. E. miniature tungsten lamp.

The Hipcoscope is made in two sizes, No. 60 weighing 1 lb. and listing at $3 complete with batteries, and No. 65 weighing 10 oz. and listing at $1.75 complete with batteries. They are especially valuable for the use of

The Hipcoscope

Made in two sizes, first weighing ten ounces and selling at $1.75; the other, one pound, selling at $3.00.

the truck operator, as he can easily read road signs and house numbers without dismounting from the seat.

SERVICE FROM THE FACTORY

The sales manager of a motor truck company which has obtained very notable development in its own city of 500,000 population, a strong development in its state and a good share of the business in neighboring states, attributes its success partially to its sales policy of working outward from the factory and placing its most intense efforts near home. It puts service first, always taking care of customers after they buy a truck. And as it is only 2 years old, it has found that the most economical and satisfactory plan for giving first-class service is to center the proposition at its own factory. In this way it has not only built up a large list of sales and customers, but has made sure of giving satisfaction. Now that it is ready to extend its operations somewhat farther away from home, it has a solid business to supply re-orders with the growth of business of its present customers, and further replacement of their horses with trucks; and also a good line of boosters to refer to.

Swinehart Hard-Rubber Base Demountable Tire

This is one of the latest products that the Swinehart Tire & Rubber Company, Akron, Ohio, is manufacturing for heavy-duty trucks. It is made with a hard-rubber base and is designed to fit the S. A. E. standard wheel. The metal base is so designed that it accepts a taper wedge as its means of fastening, this wedge being forced into position by means of outside flanges and bolts running through the felloe. The grip produced by drawing the flanges together by means of bolts prevents any lateral motion. Cleats or keys, placed at intervals, prevent the tires from creeping. This tire carries a guarantee of seven thousand miles.

With the unscrupulous, three coats of paint cover a multitude of sins.

The CCJ leads in circulation, advertising and prestige

Motor Truck Design and Construction Made Plain

Advantages and Disadvantages of Different Types Discussed

By C. T. SCHAEFER, Member Society Automobile Engineers

This is the thirteenth installment of a series of articles by this well-known writer, covering in a non-technical way the various constructions now current practice in commercial car design. These articles will take up, in order, the general types of chassis, the advantages and disadvantages of each, illustrated by simple diagrams, and in logical order, motor construction, ignition, carburetion, cooling, lubrication, etc., until each part of the truck has been dealt with.

PART XIII

THE TRANSMISSION

IN every gasoline engine it is absolutely necessary that some method be used for changing the relation between the speed and power of the car. When a gasoline engine is loaded above a certain limit it slows down, and the intervals between the explosion in each cylinder become so far apart as to cause the engine to labor and finally stop altogether, unless some means is used to increase the speed of the engine by decreasing the load upon it. In considering this subject it must be remembered that, when a car is using its maximum power, it may be divided either into considerable pulling power with slow speed, or high speed with low pulling power. Consequently, when a car is going at high speed and a considerable grade, or a stretch of heavy road is encountered, the car will begin to slow down until the speed reaches such a point that the engine begins to knock and labor. When this point is reached, it becomes necessary to change to a slower gear, which, for the same speed of the vehicle, gives a considerably greater number of revolutions of the engine, with a consequently larger pulling power.

This pulling power is termed "torque," and if gasoline engines could be designed as to afford an increasing torque, with decreasing speed, all would be well and the transmission could be eliminated. As it is taking into account the power of the motor at several speeds, nothing of this sort can be considered. At very low speed torque becomes of greatest importance, and this is especially true in vehicle operations.

The use of the transmission is also necessary in starting the vehicle, because until the vehicle reaches a certain momentum, there is considerable load on the engine, so that a slow speed which allows a high number of revolutions of the motor must be used.

It is generally understood that to reverse the motion of the commercial car engine is to labor under disadvantages in numerous ways. Power will be lost, owing to the inferior valve timing relation which must follow if the cam shaft was designed to suit reversing condition. Unless certain complications were introduced in the valve action, and since in any case it would be necessary to add to the flexibility of the motor by the use of a transmission, it would seem unnecessary to add to the valve motion anything by the way of complicated devices. An addition to the gear set is less complicated and the end is adequately served.

Types

The most popular transmissions are the friction, planetary and sliding gear. The friction and planetary, with few exceptions, are only used on the light vehicles, while the sliding gear type is extensively used on all sizes of vehicles.

Friction Type

There are two types of friction transmission in use at the present writing, the single disc and the double disc. This single disc type consists of a driving disc which is attached to the flywheel or an extension of the crank shaft, and always rotates with it, and a driven disc which can be slid along a cross shaft and brought into frictional engagement with the driving disc. By moving the driven disc out from the center of the driving disc the speed can be varied from nothing to maximum, and by sliding it to the opposite side the direction of motion is reversed. Before the wheel is slid in the direction of its axis it must be disengaged from the driving disc. This is accomplished by either moving the cross shaft and its bearings or by moving the driven disc. From this cross shaft the final drive may be through a single chain to the rear axle, or it may be through a single chain to the jack shaft and then through double side chains to the road wheels. Fig. 1 illustrates a friction transmission of the single disc type. The discs are shown in the high position, while the lower speeds are obtained by moving the driven disc in towards the center, and reverse is obtained by moving the driven disc toward the opposite side of center.

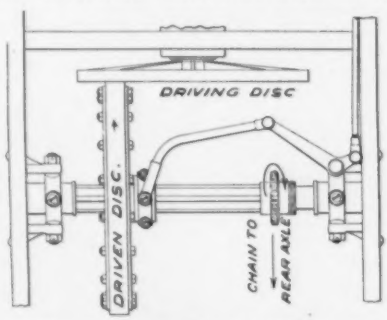


Fig. 1. Single-Disc Friction-Type Transmission

The discs are shown at high speed; lower speeds are obtained by moving the driven disc towards the center, and reverse by moving it past the center.

Planetary Type

The planetary transmission is somewhat cheaper to manufacture than the sliding gear type and also requires less skill in operation. There are two types of planetary gears, those comprising internal gears and those comprising only spur gears in their makeup. The latter is the most popular type and will be considered in this article.

Fig. 2 depicts this type of transmission, and its principle of operation may be described as follows:

The driving shaft "A" carries the driving pinion "B," which meshes with the planetary pinion "C." The latter forms part of sets of three pinions which are formed integral. "D" is the low-speed planetary pinion meshing with the low-speed gear "E," which is secured to the driver shaft "F." By applying the brake band "G" to the combined pinion carrier and drum "H," the planetary pinions are held stationary in space and act like a back gear. Pinion "B," rotating in a right-hand direction (see end diagram in Fig. 2), turns pinions "C" and "D" on their pin "M" in a left-hand direction, and pinion "D" turns gear "E" and the driver shaft "F" in a right-hand direction; that is, in the same direction as the driving pinion "B."

For reverse, band "I" is applied to the drum "J," which has the reversing pinion "K" keyed to it, being thus held stationary when pinion "B" is rotated by the engine planetary pinion "L," is forced to roll on "K" in a left-hand direction, carrying the pinion pin "M" and pinion driver "H" with it.

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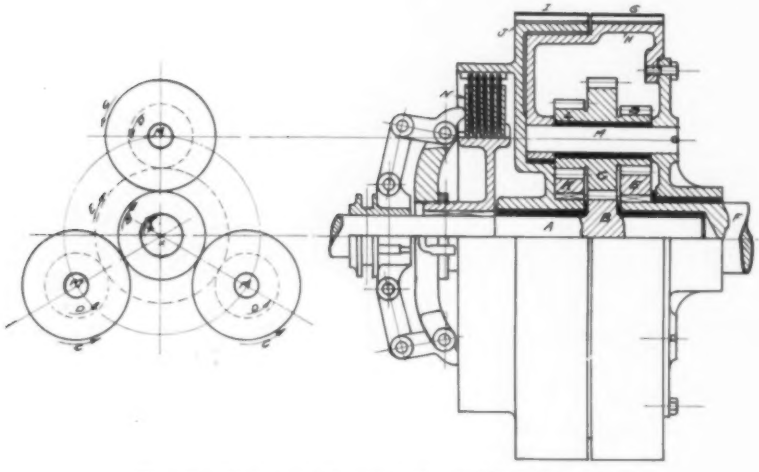

Fig. 2. Planetary Transmission With Spur Gears
For explanation of principle of operation and letters see text

Direct drive is obtained by engaging the high-speed clutch "N," which locks the reversing gear "K" to the driving shaft "A," and since two equal gears "B" and "K" are now secured to the shaft "A," the planetary pinions are locked against axial motion and the whole transmission revolves as a unit.

Sliding-Gear Type

The sliding gear type of transmission consists of two parallel shafts mounted on suitable bearings in a housing called the transmission case. The first of these shafts is known as the primary or main driving shaft. This shaft is divided into two parts, the forward or driving part and the rear or driven part, the latter being provided with a bearing at its forward end, inside the former. The second of these shafts is known as the secondary or countershaft. The driven part of the main shaft is either squared or provided with integral keys and carries the sliding gears, whose common hubs have squared holes or keyways to coincide with the shaft to make a sliding fit upon it. The driving part of the main shaft is provided with a gear, which meshes with a gear on the countershaft and forms a drive for the latter. The countershaft has a number of gears fixed upon it, depending upon the number of speeds. The gears on both shafts are so spaced that by shifting the primary set corresponding gears on the two shafts can be brought into mesh successively without interference from the other gears. Shifting of the sliding set is accomplished by means of a hand lever located conveniently to the operator and a suitable connecting linkage. The shifter rod carries a fork, which is attached to the gears in such a manner as to permit them to rotate with their shaft.

There are two common arrangements of shafts. In some cases the countershaft is located below the main shaft, while in others the two shafts are located in a horizontal plane.

When the shafts are placed vertically the case is generally cast in one piece, with a large hand hole cover plate for inspection purposes. When the shafts are placed in a horizontal plane, the case may either be cast in one piece or in halves joined through the centers of the bearings.

There are three general methods of mounting the sliding gear transmission: combining them with the motor to form a unit power plant, individual mounting on a sub-frame or main frame cross members, and combining them in a unit with the jack shaft.

All of these mountings may be made with a more or less degree of flexibility. Three-point support is most generally resorted to, with the intention of relieving the case of the stresses set up by frame weaving.

Progressive Sliding Type

In the progressive type of transmission all sliding gears are moved simultaneously when a speed change is made. The several speeds are arranged in a fixed succession as the combination of sliding gears is progressively shifted. It is thus necessary when passing from one speed to another not next to it to momentarily mesh the gears of the intervening speed. It is true with this system that less skill is required when it comes to accelerating a commercial car, since, as stated above, it is necessary to shift into the low-speed gear first and progress to the high.

Fig. 3 is a diagrammatic view of a three-speed and reverse progressive transmission which is used on a number of heavy commercial cars.

High speed is obtained by meshing the jaw clutches formed integral with the sliding member and the contact mesh gear F. Second speed is obtained by moving the sliding member backward and meshing gears D and E, so that the drive is through gear F-I-E and D. For low speed the sliding member is moved backward so that the gear "B" will mesh with the gear "C" on the countershaft, and the drive is through the gears F-I-C and B. For reverse, gear B of the sliding set is meshed with the reverse pinion G, which is constantly in mesh with the gear H on the countershaft, and the drive is through gear F-I-H-G and B. This also illustrates a unit construction of jack shaft and transmission.

Fig. 4 illustrates the non-direct type of change gear, the principle of operation being similar to the above, excepting that the high speed is obtained by meshing gears instead of jaw clutches, while the upper shaft forms the drive and carries the fixed gears. The lower is the driving shaft and carries the sliding gears. Since the high speed is obtained by meshing gears, the drive shaft may be constructed in one piece.

The principal objection to the progressive type is that it requires long shafts, which are likely to be inefficiently rigid and to spring and bend under the thrust of the gear teeth, causing noisy and inefficient operation. The great length of this transmission is mainly due to the fact that the

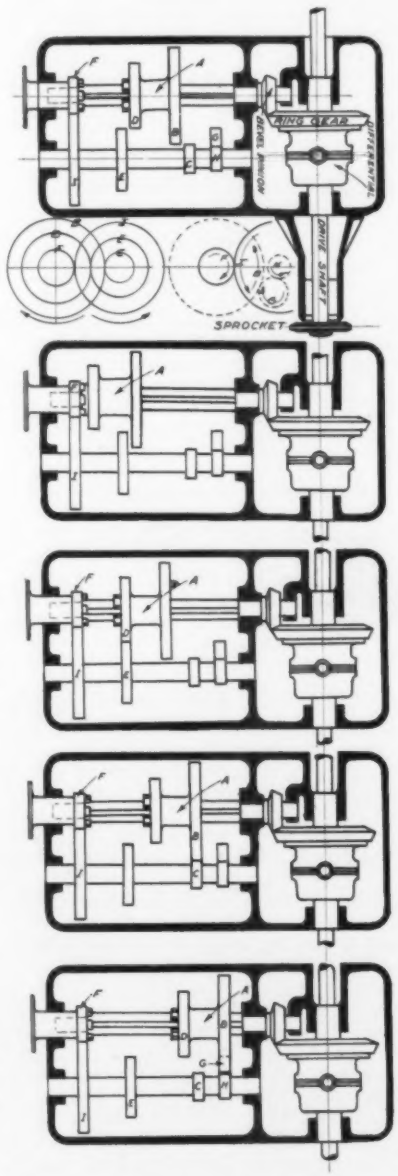

Fig. 3. Diagram of Three Speed and Reverse Progressive Sliding-Gear Transmission

From top to bottom the gears are shown in the following positons: neutral, high speed, intermediate speed, low speed, and reverse. The left half of the end diagram illustrates the forward speeds, while the right half shows a reverse engagement. This also illustrates a unit construction of transmission and jack shaft.

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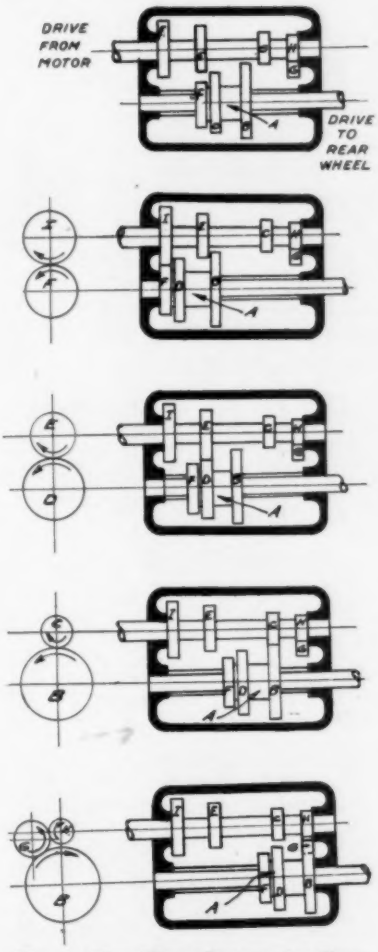

Fig. 4. Non-Direct Progressive Type

It differs from the first progressive type in having the second shaft driving the rear wheels; and the engagement of high speed by gears instead of jaw clutches.

gears on each of the shafts must be spaced relatively far apart, so as to avoid interference.

Selective Sliding Type

This objection is overcome in the selective sliding type, as two sliding sets are used. By comparing the two types it will be noted that the latter is much more compact. It also has an advantage in that the operator may change directly from one speed to any other without passing through the intervening gears.

Fig. 5 shows a three-speed forward and reverse selective type transmission. The primary shaft is squared and carries two sliding gears, which are operated by independent shifter rods. The countershaft is driven through constant mesh gears "A" and "B," "A" being driven by the drive shaft extending from the clutch. In effecting the different speeds, gear "C" is moved forward and meshed with gear "D" for low speed, while for reverse it is moved backward and meshed with the reverse pinion "E," which is in constant mesh with the reverse gear "H" on the countershaft. For second speed the gear "F" is meshed with gear "G," while for high speed gear "I," which is integral with gear "F," is moved forward and meshed with the internal gear formed integral with the constant mesh gear "A." This forms another type of jaw clutch, and in some cases the jaw clutch described above is used for effecting the high speed.

The positive clutch type of transmission is somewhat related to the selective sliding gear type. However, the gears remain constantly in mesh, and the gears on the main shaft are normally free to turn thereon, but may be fixed to the shaft by positive clutches. These clutches, when of the jaw type, are similar to those mentioned above, while internal and external gears may also be used as positive clutches. The gears on the main shaft are fixed while the clutches are free to slide upon keys or squared portions of the shaft.

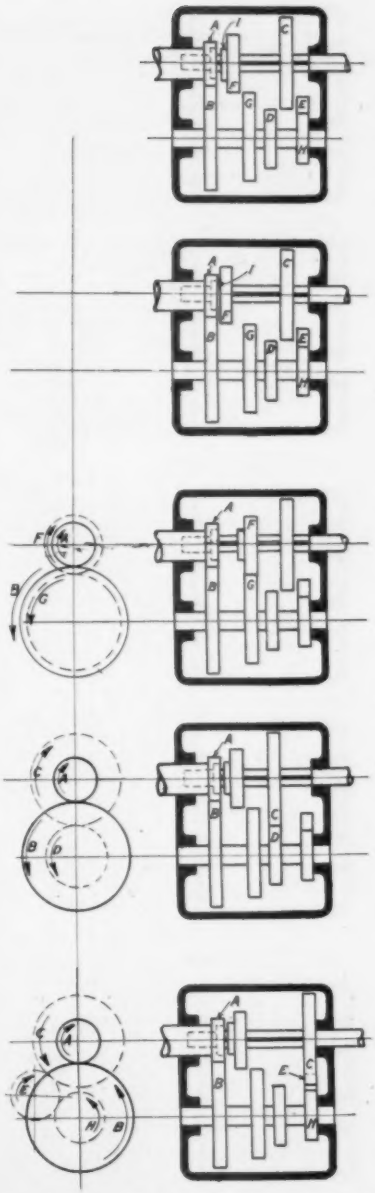

Fig. 5. Three Speed and Reverse Selective Sliding Gear Transmission

The primary shaft carries two separate sliding gears, one being used for engagement of low and reverse speeds, the other for intermediate and high speeds. By this method, any speed may be engaged without passing through any other speed, as is sometimes necessary in the progressive type.

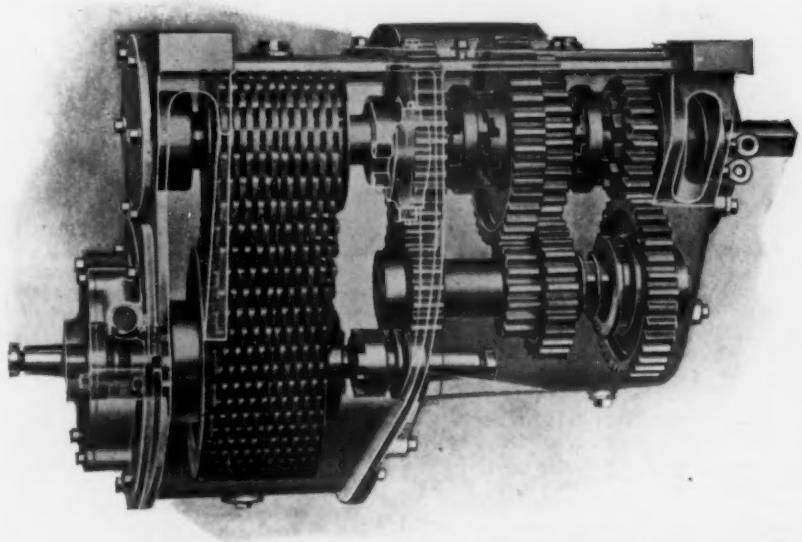

Fig. 6. Positive Clutch Type of Transmission

Gears are constantly in mesh, engagements being effected by the meshing of jaw clutches, which are made to rotate with the shafts by means of splines or keys, while the gears are free to turn on the shafts

In this type the speed changes are obtained by the individual clutches, but since the high speed is direct through the case and the speed of the countershaft is reduced through the constant mesh gears, a provision must be made so that the latter shaft cannot turn in its bearings. This is accomplished by disengaging a clutch on the countershaft, simultaneously with the engagement of the high-speed clutch. Fig. 6 illustrates this type of transmission. It also presents a method of driving all four wheels by the addition of another shaft and silent chain.

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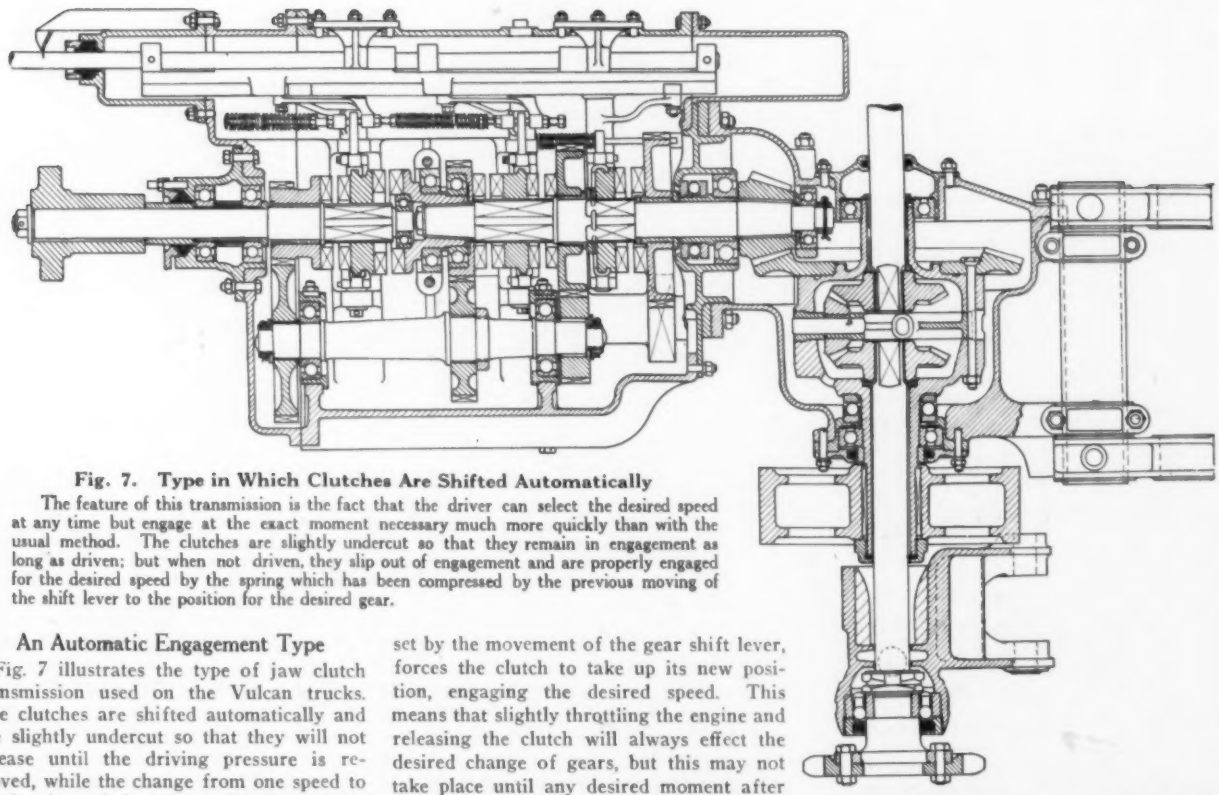


Fig. 7. Type in Which Clutches Are Shifted Automatically

The feature of this transmission is the fact that the driver can select the desired speed at any time but engage at the exact moment necessary much more quickly than with the usual method. The clutches are slightly undercut so that they remain in engagement as long as driven; but when not driven, they slip out of engagement and are properly engaged for the desired speed by the spring which has been compressed by the previous moving of the shift lever to the position for the desired gear.

An Automatic Engagement Type

Fig. 7 illustrates the type of jaw clutch transmission used on the Vulcan trucks. The clutches are shifted automatically and are slightly undercut so that they will not release until the driving pressure is removed, while the change from one speed to another is made by means of springs. This action is accomplished as follows: moving the gear shift lever compresses a set of springs which control the arms which move the jaw clutches. However, as the clutches are undercut this spring action has no effect, but just as soon as the engine speed is momentarily reduced there is a tendency for the vehicle to drive the engine, which instantly frees the jaw clutch, which, under the action of the compressed springs already set by the movement of the gear shift lever, forces the clutch to take up its new position, engaging the desired speed. This means that slightly throttling the engine and releasing the clutch will always effect the desired change of gears, but this may not take place until any desired moment after the gear shift lever has been moved. By this arrangement it is possible for the driver to approach a hill and before reaching it, if he thinks it too steep for the highest speed, he can set the lever for the next speed. The jaw clutch will not shift as long as the engine is driving until at the desired moment on the hill, by releasing the clutch the change will be automatically effected.

Transmission gears are usually lubricated by a non-fluid oil. For easy introduction of the lubricant, a hole is provided in the cover plate, which is enclosed by a screw plug, while a drain plug is usually placed at the bottom so that the stale lubricant may be washed out with kerosene or gasoline. The bearing caps are invariably provided with felt washers, while all other parts are provided with paper gaskets, to prevent the lubricant from working out of the case.

TRADE CONDITIONS IN MOTOR TRUCK INDUSTRY

Better Drivers Key to Getting Service on Reasonable Basis

The service proposition is one which demands serious attention and a co-operative attitude among manufacturers and users of motor trucks. The sales manager of a company having a large business on the Pacific Coast has found that this is as perplexing and troublesome a question now as the matter of demonstration 2 or 3 years ago. At that time he knew of one firm which boasted that it had secured 30 days absolutely free complete hauling service, through the abuse of demonstration privileges extended by a manufacturer; and practices along this line were common. To-day unreasonable service is very often demanded by concerns which will not take the trouble or pay the wages to secure competent drivers. One case of this type has been remedied by educating the firm to secure good drivers, including one particularly good man at a good wage who is made responsible for the other drivers and the condition of the trucks.

Before doing this the company had one of its trucks in for repairs of more or less serious nature every day or two. Since it has not experienced any trouble or continued to impose upon the manufacturer. A good deal of the trouble experienced is due to three causes: failure to make proper inspection at night and see to necessary minor repairs promptly so as to prevent them from developing into serious breaks; failure to prevent overspeeding and overloading. All of these matters are under control of the drivers and the remedy is to employ competent men with a sense of responsibility, and put the responsibility up to them and pay them for bearing it, with one man in charge of all cars and drivers, whom he should be allowed to hire. This is a matter of educating the buyer, in which all truck manufacturers and salesmen and the commercial car journals can co-operate to good advantage. If the buyer comes to the manufacturer and asks him to pick or supply drivers, the manufacturer will find it good policy to sidestep, as he should not be made to accept the responsibility for the driver in addition to the car, but should put it up to the truck owner to learn to hire good men himself. Some of the best truck drivers are being developed from teamsters who know how to load and unload, and get about town, and are old enough to have developed through natural growth of experience a sense of responsibility, and understanding that it is not necessary to go about town as fast as the truck can be pushed, or pile up a load double the rated capacity in order to secure a commendable record.

This company has experimented some with governors and speed indicators, and has given up this line of work, because it finds that with solid tires and the jolts and jars of the road, the speed indicators are not invariably reliable, and the governor is not accurate to within 4 miles or so, can be altered by an intelligent driver, and furthermore it is a bad handicap when a man gets down in a hole, or some other tight place, and needs all the power his engine will develop.

The Clearing House Parcel Post Delivery Company, of Boston, Mass., is making a specialty of delivering packages in that city and 120 towns in the vicinity within a radius of 35 miles.

The CCJ has most advertisers because it gives them biggest returns

Philadelphia to Have an Auto 'Bus Line

By J. HOWARD PILE

PHILADELPHIA is the third largest city in the United States from the standpoint of population, and regarded in the light of area, stands higher yet. Notwithstanding this fact, its street car service does not begin to compare with very much smaller cities. .

Several years ago motor 'buses were tried out in competition with certain car lines, but they were a failure for a number of reasons. In the first place, they were electrics of enormous weight and carried only thirty-four passengers. The maintenance charges were excessive on all parts of the equipment, and the initial cost was high. In addition to this, the city charged for 'bus licenses and made a charge to help defray the expense of street paving. The routes were indefinite, and the rate of fare was equal to that of the street cars, with slower service. Later, before the failure, the fare was increased.

The new 'bus line, which will be placed in operation just as soon as Councils grant the franchise, is to be operated by the United Traction Improvement Company, of which Walter C. McIntire is president, Victor H. Conkle, secretary and treasurer and Walter J. Spangler, chief engineer. The company claims that it can operate the new 'buses at a saving of 50 per cent. per car mile over the old ones, the seating capacity is increased 35 per cent. and the routes have been definitely fixed with due regard to the movement of passenger-carrying traffic. There will be 120 vehicles in operation.

All 'buses will be of the double-deck type, side seats, seating twenty-five inside and twenty-seven on roof. All windows drop into side panels, thus making the inside of 'bus convertible to an open car in suitable weather, and enclosing same against storm and cold. The inside of the car is heated from exhaust of the engine and lighted from a storage battery.

The lighting equipment consists of thirteen 8 c.p., 6-volt lamps inside, six spaced evenly on each side and one light inside rear entrance, one on rear platform, one tail light, two headlights and two route-indicating sign lights, a total of nineteen lights. Current is supplied for same from a six-cell 300-ampere hour Salom type battery, cells of which are connected in multiple series of three each, same being located under stairs leading to roof. The lamps are controlled from four circuits, the switch box for lights and buzzer circuit being mounted on the inside of stairs leading to 'bus roof. Each side post inside of 'bus and end post at rear door is equipped with signal buzzer.

The 'bus body is mounted on a Blair five-ton gasoline-electric chassis; engine, Continental type, 5½-in. stroke and 4¼-in. bore; dynamo, 250 volts and 12-kilowatt capacity; motor, 250 volts and 15 h.p. Dynamo is compound wound, series winding, connected in series with motor winding through one-point controller. Shunt winding on dynamo is connected in series with field rheostat for regulating speed of 'bus by voltage variation; dynamo direct conected to crank shaft of engine; motor direct connected to worm shaft of rear axle.

Electrical parts manufactured and supplied by Westinghouse Electric & Manufacturing Company. Some of the dimensions are: height of 'bus, 12 ft. 7 in.; width, 7 ft. 4 in.; length 23 ft.; weight, empty, 10,500 lbs.; speed under full load, 20 m.p.h.

One of the principal points of interest is the fact that the rate of fare is to be $.05, or six rides for $.25. This will be quite a feature, as the street car lines have abolished the six-for-a-quarter tickets and charge $.05 straight. The company will divide equally with the city all

One of Philadelphia's New Auto 'Buses

The upper left view is the interior or lower section, seating twenty-four persons besides the driver. The lower right view is on the upper deck. The other views are taken from different positions. This is the first of an order for 120 similar 'buses to be operated on the streets of Philadelphia

profits after paying interest on bonds, charges on sinking fund and 6 per cent. on stock.

The routes have been carefully thought out so as to serve the car-riding public to the best advantage, and the company promises quick and frequent service.

The 'buses will operate over three routes:

Route No. 1—Starting Front and Market, west on Market to City Hall, north on Broad to Diamond, west on Diamond to Thirty-third, north on Thirty-third to Thirty-third and Dauphin Streets. Feeder route to No. 1 will extend from Twenty-fifth and Diamond north on Twenty-fifth to Allegheny, west on Allegheny to Twenty-seventh, south on Twenty-seventh to Diamond, returning over same route to Front and Market.

Route No. 2—Starting Front and Market, west on Market to City Hall, south on Broad to Porter, west on Porter to Twenty-first, north on Twenty-first to Wolf, west on Wolf to Twenty-second, north on Twenty-second to Mifflin, west on Mifflin to Twenty-fourth, north on Twenty-fourth to Christian, east on Christian to Broad, thence to Front and Market. Dividing point on route will be Twenty-first and Wolf, one-half of 'buses going one direction and other half opposite direction.

Route No. 3—Front and Market, west on Market to Thirty-second, south on Thirty-second to Chestnut, west on Chestnut to Thirty-third, south on Thirty-third to Walnut, west on Walnut to Sixty-third, returning over same route.

Auto Line Basis of Railway Traffic Increase

California Steam and Electric Railway Systems Start Selling Through Transportation, and Advertising Travel, Over San Bernardino Mountain Auto Line

By FRANK H. REED

MOTOR trucks have transformed the San Bernardino Mountain country in Southern California from an inaccessible wilderness scenic wonderland into a tourists' center of national importance and a business asset that is drawing many thousands of dollars of annual revenue. The development of an automobile transportation service of absolute reliability and adequacy has enabled resort owners and steam and electric railway lines touching the region to enter on a campaign of development and advertising which will bring big money into their treasuries.

Kirk Phillips, proprietor of the San Bernardino Mountain Auto Line, has just completed arrangements whereby he secures reciprocal traffic advantages with the Santa Fé system and with the Pacific Electric Railway, which operates a highly developed network of lines extending from the mountains to the beach resorts of the Pacific.

The Santa Fé is placing the auto line tickets in all its Southern California offices, to be sold in conjunction with tickets over its own lines to provide a through trip. It is probable that this service will soon be extended to its offices throughout the country and to the tourist ticket agencies. The P. E. has gone a step farther and has already filed tariffs concurring with those of the auto line, which latter have been published and filed with the California Railroad Commission, and coupon tickets good over the auto line are sold by its agents at all ticket offices. Both railway companies are featuring the auto line in display advertising in newspapers and in literature for special distribution.

Phillips has been operating not quite 3 years. In this time he has not only made the unique success of securing the advantages of this extensive advertising and comprehensive traffic developing facilities which these powerful railway systems have been years in developing, but has obtained the warm personal endorsement of his ability to handle traffic from men who, in the railway field, have become masters of the art of supplying transportation for persons and freight. They know that when they advertise Phillips' schedule he will back it up with 100 per cent. performance.

Three years ago the line was started with one truck, working over poor roads, to few resorts, little known and scantily equipped. The owner and his wife had their ideals and worked constantly to give a dependable service. "Safety first," maintenance of schedule, combined with close personal planning and supervision of every feature of the service, a vision broad enough to see the right line of development, a sense of proportion to achieve it and the ability to co-operate sanely with parties having collateral interests, whether smaller or greater than his own, have secured him a growth to nine trucks with his own machine shop, traffic to keep every vehicle busy and promising to double his present business in 1915. He has marvelous scenic roads to operate over, and takes people to resorts which are now prosperous, good advertisers heavy users of supplies. The railway business shows a fine growth, auto owners reap the benefit of his pioneering, and at the camps sleep on comfortable beds and eat foods which have paid toll to the Mountain Auto Line.

Courtesy Santa Fe Railway

Splendid Mountain and Forest Scenery Opened Up by Kirk Phillips' Auto Line

The Phillips' line now owns nine vehicles, all White machines; three three-quarter ton, four one and a half ton, used in combination freight and passenger service; one five-ton, in freight service only; one touring car. Its routes cover a circuit of 100 miles, mostly in mountain country, following scenic roads built up and over slopes of mountains which rise a mile or more above the plain. These new high altitude roads, built in a radical departure from the policy which has carried the good roads of the Eastern Adirondacks and White Mountains economically, if not grandly, along water levels and through valleys, owe their existence more to Phillips' ability and persistency as an energizer of the spirit of public improvement than to any other single factor, with the exception of the marvelous beauty of the region they open to travel.

The five main trips of the auto line are as follows: San Bernardino to Pine Crest, 18 miles, 2½-hour passenger schedule.

San Bernardino to Big Bear Valley, 40 miles, 4½ hours.

Pine Crest to Big Bear Valley, 40 miles, 4½ hours.

San Bernardino to Glenn Ranch, 19 miles, 1½ hours.

Hemet to Idyllwild, 23 miles, 3 hours.

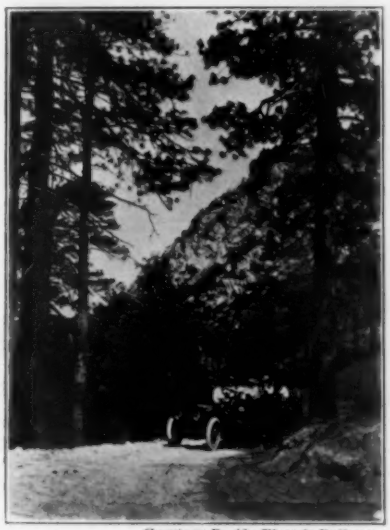
The P. E., can now sell a 30-day round-trip ticket, Los Angeles to Knights, 60 miles by rail, 96 by auto, for $14.85.

These are all in mountain territory. Roads are smooth, hard dirt, no sand; grades to 22 per cent. The Pine Crest route has a total rise of 4400 ft.; 8 miles average more than 12 per cent. grade. Machines run one 7-mile stretch on low. On the Big Bear Valley route there are 12 miles across valley country, a 28-mile rise of 5200 ft., worst grade 22 per cent., and they pull over 10 miles on low.

The CCJ is the only truck journal a member of the Audit Bureau of Circulation—Why?

The overload conditions on these grades make the reliability record of Mr. Phillips' trucks worth heeding. He always overloads. It is a feature of his business policy. He figures on a two-ton load for each of his one and a half ton trucks, and will not let them go out with less. He can't make money enough without overloading. His five-ton truck carries capacity loads; has pulled 5½ tons on a test run. He finds that with these loads he can pull his long low-gear hauls on the hottest days of Southern California summer and not boil the water. He once ran his standard 40-h.p. five-passenger White touring car, remodeled to a ten-passenger body, three round trips to Pine Crest, 100 miles, and then made the complete circuit of the mountain route, 100 miles, and filled the radiator with a pint cupful of water. This haul was made with a load of nine big men.

A paying distribution of traffic is worked out through the use of combination bod-



Courtesy Pacific Electric Railway

Showing How Phillips "Piles Them Up"
The overload pays the profit

ies. Passenger traffic pays best. If a full load of people is available, so much the better. Their baggage is taken along lashed to the sides. Otherwise, seats are removed and freight for the resorts loaded to overload capacity of each truck.

Rates on goods are graduated in three classifications. Baggage, receiving immediate delivery with passengers, takes the highest rate. Resort freight rates are fixed by contract. "Perishables" and short-time freight, as laundry, take a rate of 30 per cent. higher than "heavy freight," on which the line is allowed reasonable leeway in time. Passenger trips are made on schedule, and if capacity for perishable freight due is lacking, the truck makes another round trip, filling any spare capacity with "heavy freight." In rush times, milk, ice, etc., are not received and held for the trip, but are left with producers until a truck can pick them up and make an immediate haul. Mail is carried on some routes.

The traffic arrangements with the Santa Fé and P. E. lines were a direct result

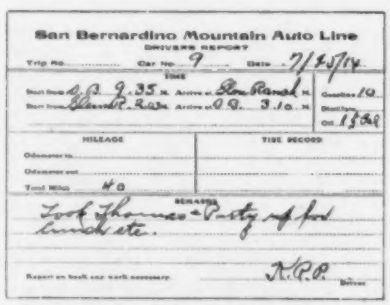
Courtesy Pacific Electric Railway

A three years reliability record of but four failures, requiring auto to be towed, means careful driving over these roads—and good cars.

of the safety, regularity and all-round dependability of the auto service from its beginning. This is the first arrangement of the kind in California, and the only similar one on record is that of the Northern Pacific, with auto lines in Glacier National Park, which, however, presents the important difference that the auto line is under control of the railroad and not independent. Close supervision by the owner is what has established the grade of truck service and held it up. Every truck is thoroughly inspected after each trip. No defective truck is allowed to go out. There has never been a serious accident on the line. In about 3 years of operation there have been only four car failures requiring sending of another car to bring in the one damaged. Failure in any respect has occurred in less than one-quarter of 1 per cent. of the total trips.

Drivers are picked and trained with the closest care by the proprietor. He goes himself with every man on his first trip over a route. He develops his best men, as he says, from "green, inexperienced drivers," preferably from teamsters off ranches, not necessarily mountain men. These men know how to handle a team and load a wagon. They can pick up a bale of hay or a sack of grain without taking too much time to think about it, and load it so it will ride.

The same man is given the same run all the time so far as practicable. This tends toward safety, reliability and economy, and



San Bernardino Mountain Auto Line
DRIVER'S REPORT

Trip No. ..... Car No. 9 Date 7/25/14

TIMES

Start from L.A. 9.35 A.M. Arrive at Glen Rand P.M. Condition 10

Start from Glen Rand P.M. Arrive at L.A. 3.10 P.M. Start Odo. 13542

MILEAGE | TIRE RECORD

Odometer in .....

Odometer out .....

Total Miles 40

REMARKS

Took Thomas Party of Ford Luncheon.

Report on back any work necessary ..... N.P.P. Driver

Card Report Made Out for Each Run
All items of expense posted to ledger account for car involved

makes the records mean more. A card record is kept of every run and a ledger account is carried with every car. Repairs are made, and material bought only on written order of the proprietor. Control is better than a check. Depreciation is written off 33 1/3 per cent. per year. Mr. Phillips does this to be a little more than safe. His first car, 3 years old, is now fully charged off on the books, but is in as serviceable condition as when new. His card system gives Mr. Phillips' data for comparative analysis of traffic features, both freight and passenger, as well as performance of individual cars and drivers. He spends much time on this work and says one must to make a success of truck operation. Keeping them running, loaded, on paying hauls, and keeping out the leaks is what makes operation profitable.

BETTER SPEED FOR HEAVY TRUCKS

A Western dealer, who handles a high-grade, high-priced truck, and does a large business, states that his careful investigations have led him to the opinion that truck manufacturers should work for a road construction which will permit speed above 8 to 9 m.p.h. for the five- and six-ton trucks. He believes that on a haulage cost basis, a five-ton truck, at 8 or 9 m.p.h., cannot compete successfully with horses and mules, thus restricting the market to cases where the truck can be purchased on account of its ability to perform service in the way of speed and daily mileage which is not possible for horses and mules.

With improved roads and a truck which can stand the vibration at the higher speed, a great many more heavy-duty trucks will be sold. The repair bills on a truck run light are about equal to those of one run loaded. One instance where records were made over a period of several months leads this dealer to the conclusion that they may be even lighter for the truck which is run under load close to rated capacity, than on a truck run very light and empty a great part of the way.

The Saratoga Vichy Spring Company, Saratoga Springs, N. Y., is an ardent convert to truck transportation. During the spring of this year this company purchased two Palmer-Moore trucks, which have been in constant use all summer delivering soft drinks in a manner most pleasing to the owners as well as a constantly increasing list of customers.

While the mileage is not large, averaging only about 30 miles a day to each truck, a great many calls are made in Saratoga Springs besides daily trips to Ballston Spa and Schuylerville The average load is thirty cases of one-dozen quart bottles each, a total weight of about 1650 lbs. From ninety to one hundred cases of bottled goods have been delivered daily on each truck. One truck is used exclusively for family trade and the other for hotels, restaurants and saloons. The trucks are kept busy every minute, and are always ready for something else. In fact, the drivers report that during the day they hardly shut down their engines at all except for lunch.

Besides commenting on the advantage of better service to its customers, this concern also states that the trucks advertise its goods effectively.

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

A Formula for Estimating Motor Truck Operating Costs*

Foreword

THIS formula has been devised in response to a demand from prospective motor truck buyers for reliable information as to motor truck operating costs.

Economical operation can be assured, in large measure, by the buyer selecting the right size and type of motor truck for the work to be done—by fitting a truck to his business, instead of trying to fit his business to some particular truck after an ill-advised purchase.

Careful operation under intelligent supervision over loads, speed, routes, etc., and maintaining the truck at all times in proper working condition, will materially reduce operating cost.

The following estimates are based on normal operation under average conditions; but there are so many factors which the manufacturers cannot control after the truck leaves the factory, that it must be obvious that they cannot guarantee operating costs. Therefore, these estimates are not represented, and are not to be considered—under any circumstances whatever—as a guaranty.

Any owner who operates his truck within its limitations and with the ordinary care he would give to any other piece of machinery representing an equal investment, can reduce the average costs shown in these estimates. On the other hand, an owner who fails to exercise reasonable caution or a due regard for his truck's limitations, must expect his operating cost to exceed the average costs shown in these estimates.

Each item has been conservatively figured. A prospective buyer should observe the variations noted, and adapt his own estimate to his own conditions. He should then make a careful comparison between his estimate thus calculated and his present haulage costs.

Until the advent of the motor truck, the analysis of delivery costs was frequently neglected—often entirely overlooked—by most users of horse-drawn vehicles, and when their haulage costs are now analyzed it is frequently found that items which were properly chargeable to haulage accounts have not been classified as haulage cost, and have been charged to other accounts.

To insure a fair comparison—one that will be in justice to the prospective buyer as well as to the motor truck—we reprint a statement recently issued by the Team Owners' Association of Boston, Mass.

What Does it Cost to Run a Horse Per Day? Misunderstanding of Cost

The cost of keeping a draft horse and the cost of operating a business wagon or caravan, would seem to the man not in the drayage or express business as a very simple problem, and to many in the business it may also seem simple, but when there is such a disparity of ideas that some of the oldest and shrewdest men in the drayage business in Boston have been known recently to let a high paid driver and pair of valuable horses and caravan, with all the equipment that goes with it, at a price ranging from $6 to $7 per day, and where other men in the same line of business, who certainly would not ordinarily be rated as among the more shrewd, are letting a similar team for $10 per day, it seems as if there must be a woeful lack of understanding in some quarters as to what it costs to run a truck.

There has been so much friendly discussion in the Team Owners' Association among the hundred or more prominent men identified with the trucking trade in Boston, as to what it does cost to keep a horse per day, and as to what the lowest fair working value of a one or two-horse truck per day is, that a few men in the business recently invited Mr. W. H. S. Jarvis, of Jarvis, Crawford & Company, Certified Public Accountants, to address them and give some of his experiences and observations from auditing different trucking businesses.

Mr. Jarvis spoke to a most interested audience for about an hour and after that stood a running fire of questions, all of which were answered in a good spirit, and evidently with satisfaction to his hearers.

Facts Brought Out

He made a few remarks that certainly were very illuminating to his hearers. Some of these points seemed rudimentary, but the writer was impressed with the fact that many men who have spent their lives in the business do not, until it is specifically called to their attention, realize what Mr. Jarvis brought out very clearly. To start with, there are 365 or 366 days in a calendar year. A horse, to take the horse as a unit, must be fed, housed, maintained and cared for during the 365 days, but to get his earning capacity, excepting the unusual occasions of a few Sundays or night work, there should be a deduction of 52 days for Sundays and 9 for holidays (61 days), leaving 304 effective days. This is actually a reduction of 16 2-3 per cent. or 1-6.

Further, for illustration, a large drayage business of just two hundred horses must, of course, have from four to six driving horses for the use of managers and foremen in properly directing the work. There are spare horses or sick horses, which would bring the total of unproductive horses up to about twenty, that is 10 per cent. Now, these driving horses must be fed and cared for, as well as the sick horses, and this takes off 10 per cent. more from the 83 1-3 per cent. left, which would would leave exactly 75 per cent. Therefore, if it costs, as it does at present, $19.87 per month to feed a heavy draft horse, and there are two hundred horses in the stable, it means an expenditure, at present prices for oats, hay and other feed, of $3974, and to get the cost of keeping one draft horse effectively in the street per day, divide by the number of horses, and make allowance for holidays, and this would be 90 cents per horse per day, from which you must not jump to the conclusion that anyone claims a horse actually eats 90 cents' worth of feed per day. What it actually eats is 66 cents at present prices, and the rest is added as his proportion of that food eaten by the idle horses, the sick horses, and that proportion of the holiday divided up on to the working day.

A two-horse team, where the driver gets $15 per week, would figure out at the start as follows:

Driver's pay per day	$2.50
Each horse feed per day in the street (90 cents)	1.80

Mr. Jarvis then produced a tabulation which he had worked out from a large drayage concern, showing eleven other items, many of which would be brushed aside by a practical man when he figures on the back of an envelope the cost of running his teams by putting in about four items.

Cost of Operating Single and Double Team in Boston

	One-horse team	Two-horse team
Driver's pay per day	$2.00	$2.50
Feed per working horse per day	.90	1.80
Rent and stable expenses per horse per day	.31	.62
Shoeing and small repairs per horse per day	.19	.38
Claims, accidents, tolls, etc.	.18	.36
Foremen's and jumper's pro rata	.18	.36
Other helpers per horse per day	.20	.40
Repairs, harnesses, and painting	.13	.26
Manager's or superintendent's salaries per day	.10	.20
Office rent, telephones and clerks	.31	.62
Miscellaneous, veterinary, etc.	.24	.48
Fire and accident insurance	.08	.16
Depreciation for renewals of horses	.20	.40
	$5.02	$8.54

This figures out $8.54 for a two-horse truck kept up to standard in a good business.

Conclusion

It would seem from the amove figures that any man that thought of letting a truck for $8 a day or less is cheating himself, and if he will look over these twelve items he will claim as he owns his stables, he does not have to pay stable rent, and as he puts his own time in, perhaps, working 15 to 18 hours per day, he is saved manager's salaries. But, is that an intelligent way to run a business, and is not the important business of transporting through the streets of a city like Boston millions of dollars' worth of costly goods and the largest amount of wool handled in any city in the world, with the possible exception of Liverpool, worthy of a position that will

*From a booklet issued by the General Motors Company.

The CCJ has most readers because it gives most information

permit at least a 6 to 10 per cent. return on capital actually invested, and a few hours' release from business cares for those employed in this most responsible calling?

Corrected to February 15, 1914.

Fuel Consumption—Gasoline

We have figured gasoline consumption as in the following schedule, based on cost of 18 cents per gallon:

Model	Miles Per Gallon	Cost Per Mile
VC	8	$0.0225
SC	7	.0257
H	5	.036
HU	5	.036
K	4	.045
KU	4	.045

Wherever gasoline costs more or less than 18 cents per gallon, proportionate variations should be made in these estimates.

Oil

We have figured oil consumption as in the following schedule, based on cost of 40 cents per gallon:

Model	Miles Per Gallon	Cost Per Mile
VC	125	$0.0032
SC	110	.0036
H	90	.0044
HU	90	.0044
K	75	.0053
KU	75	.0053

Wherever a good grade of motor oil costs more or less than 40 cents per gallon, proportionate variations should be made in these estimates.

Grease

We have figured grease consumption in transmission, wheel bearings, grease cups, etc., as in the following schedule, based on cost of 10 cents per lb.:

Model	Miles Per Pound	Cost Per Mile
VC	150	$0.0007
SC	150	.0007
H	100	.001
HU	100	.001
K	100	.001
KU	100	.001

Wherever heavy transmission oil is used instead of grease, these estimates should be varied according to price paid for the transmission oil, consumption of which will be about the same as of grease.

Depreciation

This item includes depreciation of chassis only, exclusive of tires, because tire wear has been figured as a separate item of operating cost.

In practical accounting it is considered prudent to write off as depreciation an annual percentage of the original cost of a machine at such a rate as will ultimately write the machine entirely off the assets before its usefulness has ceased.

This practice is undoubtedly good finance, but it would be misleading for the purpose of these estimates, because it does not distribute the cost over the entire period of the truck's utility. The result would be that the first few years would be made to carry the entire burden, and the remaining years would enjoy freedom from a charge which is justly their due.

It is, of course, optional with any user to establish his own rate of depreciation, but our judgment, based on experience, is that 20 per cent. a year is sufficiently conservative for accounting purposes, and entirely fair to any gasoline truck operated intelligently under normal conditions. The following estimates are therefore figured on that basis:

Model	Price	Less Tires	Net	20% Per Year	Cost Per Working Day
VC	$1500	$194.17	$1305.84	$261.17	$0.87
SC	1900	257.01	1642.99	328.60	1.10
H	2250	337.81	1912.19	382.44	1.27
HU	2500	459.39	2040.61	408.12	1.36
K	2750	431.95	2318.05	463.61	1.55
KU	3000	555.58	2444.42	488.88	1.63

Storage

The following rates are fairly representative of public garage charges in the larger cities, for "in and out" storage, plus washing:

Model	Washing Once a week Per mo.	Per day	Washing Twice a week Per mo.	Per day	Washing Every night Per mo.	Per day
VC	$17.50	$0.70	$20.00	$0.80	$25.00	$1.00
SC	17.50	.70	20.00	.80	25.00	1.00
H	17.50	.70	22.50	.90	27.50	1.10
HU	17.50	.70	22.50	.90	27.50	1.10
K	19.00	.76	27.50	1.10	32.50	1.30
KU	19.00	.76	27.50	1.10	32.50	1.30

Wherever public garage rates differ from the above, proportionate variation should be made in these estimates.

Fleet owners operating their own garages can readily determine what proportion of the total garage operating cost to charge against each truck.

Repairs

This item includes repairs to chassis only, exclusive of tires, because tire wear has been figured as a separate item of operating cost.

Certain moving parts will eventually give out through natural wear, and the replacement of such parts will naturally be more frequent as the truck grows old.

The necessity for such replacements will always be in direct proportion to the care used in operating the truck and maintaining it in proper working condition.

Then there is the liability to minor accidents. Repairs due to serious accidents are not contemplated under this head, as the insurance allowances in these estimates afford ample protection in such cases.

Since all these factors will not be exactly alike in any two installations, it is impossible to foretell just what these repairs will amount to on any one truck. Experience has shown, however, that 10 per cent. per year of the cost of the chassis, less tires, is usually a sufficient reserve for such contingencies, and in these estimates chassis repairs are figured on that basis, as per following schedule:

Model	Price	Less Tires	Net	10% Per Year	Cost Per Working Day
VC	$1500	$194.17	$1305.84	$130.58	$0.44
SC	1900	257.01	1642.99	164.30	.55
H	2250	337.81	1912.19	191.22	.64
HU	2500	459.39	2040.61	204.06	.68
K	2750	431.95	2318.05	231.81	.77
KU	3000	555.58	2444.42	244.44	.81

Corrected to February 15, 1914.

Interest

In these estimates interest has been figured at the rate of 6 per cent. each year on the amortized value of the chassis after the yearly depreciation has been written off.

The interest charges for each of 10 years, as figured, has been averaged for 1 year, as below:

Model	VC Principal	VC Int.	SC Principal	SC Int.	H Principal	H Int.
1st year investment	$1500.00	$90.00	$1900.00	$114.00	$2250.00	$135.00
1st year depreciation	261.17		328.60		382.44	
2nd year investment	1238.84	74.33	1571.40	94.28	1867.56	112.05
2nd year depreciation	261.17		328.60		382.44	
3rd year investment	977.67	58.66	1242.80	74.57	1485.12	89.11
3rd year depreciation	261.17		328.60		382.44	
4th year investment	716.50	42.99	914.20	54.85	1102.68	66.16
4th year depreciation	261.17		328.60		382.44	
5th year investment	455.33	27.32	585.60	35.14	720.24	43.21
Total for five years		$293.30		$372.84		$445.53
Average for one year		58.66		74.57		89.11
Average per working day		.20		.25		.30

Model	HU Principal	HU Int.	K Principal	K Int.	KU Principal	KU Int.
1st year investment	$2500.00	$150.00	$2750.00	$165.00	$3000.00	$180.00
1st year depreciation	408.12		463.61		488.88	
2nd year investment	2091.88	125.51	2286.39	137.18	2511.12	150.67
2nd year depreciation	408.12		463.61		488.88	
3rd year investment	1683.76	101.03	1822.78	109.37	2022.24	121.33
3rd year depreciation	408.12		463.61		488.88	
4th year investment	1275.64	76.54	895.56	53.73	1044.48	62.67
4th year depreciation	408.12		1359.17	81.55	1533.36	91.00
5th year investment	867.52	52.05	463.61		488.88	
Total for five years		$505.13		$546.83		$605.67
Average for one year		101.03		109.37		121.13
Average per working day		.34		.36		.40

Any user whose money is worth more or less than 6 per cent. should vary these estimates proportionately.

Corrected to February 15, 1914.

Tires

These estimates are based on Solid Demountable Tires at tire manufacturers' list less their customary discounts to users—40, 10 and 5 per cent.—and their customary guaranty of 7000 miles.

Model	Size of Tires	*Tire Manufacturers' List* Each	Total	Net Cost to User	Cost Per Mile
VC	Front 2 tires 34x3	$60.00	$120.00		
	Rear 2 tires 36x5	129.25	258.50		
			$378.50	194.17	.0277
SC	Front 2 tires 34x4	96.00	192.00		
	Rear 4 tires 36x3½	77.25	309.00		
			$501.00	257.01	.0367
H	Front 2 tires 36x5	129.25	258.50		
	Rear 4 tires 36x4	100.00	400.00		
			$658.50	337.81	.0483
HU	Front 2 tires 36x5	129.25	258.50		
	Rear 4 tires 42x5	159.25	637.00		
			$895.50	459.39	.0656
K	Front 2 tires 36x6	162.50	325.00		
	Rear 4 tires 36x5	129.25	517.00		
			$842.00	431.95	.0617
KU	Front 2 tires 36x6	162.50	325.00		
	Rear 4 tires 42x6	189.50	758.00		
			$1083.00	555.58	.0794

In localities where the manufacturers' guaranty is more or less than 7000 miles, or whenever they may change their list prices or their discounts to users, proportionate variations should be made in these estimates.

Corrected to February 15, 1914.

The CCJ has most advertisers because it gives them biggest returns

Insurance

Insurance rates vary in different localities and in accordance with the nature of the risk and the age of the truck. Rate variations, however, when reduced to a "cost per day," will make such a very small difference that the following rates, quoted by one of the large automobile insurance companies, can be taken as being fairly representative.

Fire and Collision

Combination rate 3½ per cent., insurance company being liable only when fire loss exceeds $15 and when collision loss exceeds $25.

For full collision coverage, add $35 to annual premium.

Insurance may be written in any amount in excess of 50 per cent. of the original list price.

Liability and Property Damage

Fixed annual premiums, regardless of size or cost of truck.

Rate class depends upon service in which truck is used.

Business	Class
Ambulance	1
Baggage	1
Barrel and Box Makers or Dealers	4
Boiler Makers or Dealers	2
Bottlers	3
Brewers	3
Building Material Merchants	4
Carpenters	4
Cleaners and Dyers	4
Coal Dealers	4
Contractors	4
Department Stores	3
Dry Goods Stores—Retail	3
Electric Light Company's Construction and Repair Cars	1
Express Companies	1
Feed and Grain Dealers	4
Fire Patrol and Salvage Corps	Special
Furniture Dealers	4
Furniture Moving	2
Gas and Water Mains	4
Ice Cream Dealers	4
Ice Dealers	2
Ice Dealers—wholesale exclusively	4
Iron and Steel—Structural	2
Junk and Scrap Iron Dealers	2
Laundries	4
Liquor Dealers	3
Lumber Dealers and Manufacturers	4
Machinery Dealers	2
Mail Wagons	1
Masons' Materials	4
News Companies (no newspaper delivery)	3
Newspaper Delivery	1
Oil Distributing Companies	3
Parcel Delivery	3
Piano Movers and Dealers	4
Police Patrol	1
Railway Iron	2
Safe Movers and Manufacturers	3
Street Railway Company's Construction and Repair Cars	1
Telephone and Telegraph Company's Construction and Repair Cars	1
Truckmen	3
All Commercial Automobiles not otherwise classified above	5

Liability

	Annual Premium	Cost per Working Day	Annual Premium	Cost per Working Day
Class No. 1	$125	$0.42	$50	$0.17
2	100	.33	40	.13
3	75	.25	30	.10
4	45	.15	18	.06
5	35	.12	14	.05

Corrected to February 15, 1914.

Drivers' Wages

Drivers' wages will, of course, vary in different localities.

The following is a schedule of fair wages for which competent and reliable gasoline truck drivers can be secured in the larger cities:

Model	Per Day
VC	$3.00
SC	3.00
H	3.50
HU	3.50
K	3.50
KU	3.50

Employers paying more or less than the above rates should substitute the exact wages they are paying for the wages used in these estimates.

Corrected to February 15, 1914.

Working Days

In these estimates we have figured on 300 workings days to a year, allowing for 52 Sundays and the remaining 13 days for holidays, etc.

"Full Load"

By "full load" we mean a truck carrying its full rater capacity on every mile traveled throughout the day; for instance, a Model KD in road construction carrying 5 tons of crushed stone from the crusher to the pavement and carrying 5 tons of rock back to the crusher.

"Half Load"

By "half load" we mean that when a truck carries its full rated load in one direction only, discharges it at some distant point, and returns empty over the same route, it is the equivalent of carrying half its rated capacity—or "half load"—the full distance.

Ton-Mile

A "ton-mile" means carrying 1 ton a distance of 1 mile. To determine the "ton-mile" performance of a motor truck, multiply the total mileage covered in any given period of time by the average number of tons carried on each trip; for instance, a five-ton truck traveling 40 miles with a full load = 40 miles, 5 tons = 200 ton-miles; or a five-ton truck traveling 40 miles with a "half-load" = 40 miles x 2½ tons = 100 ton-mies.

Cost Per Ton-Mile

The cost per ton-mile is obtained by dividing the total operating cost during any given period of time by the "ton-miles" carried during that period; for instance, if it costs $11.05 to operate a truck traveling 40 miles with a five-ton load, the cost per-ton mile is $11.05 divided by 200 ton-miles, which equals $0.06 per ton-mile.

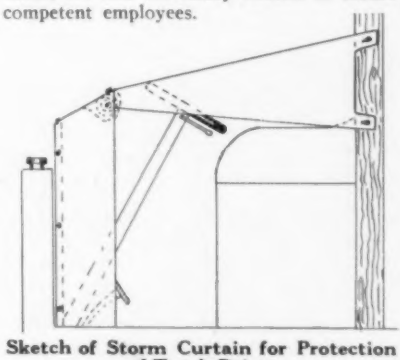
THE COMFORT OF THE DRIVER

By MURRAY FAHNESTOCK

EVEN wife-beaters and other non-members of the S. P. C. A. must admit that common sense in the care of the truck driver is one of the most important elements in motor truck engineering. A forty dollar a month stenographer is kept in a clean well heated office; while a seventy dollar a month truck driver, who can make or mar the profit on a three thousand dollar investment, is left exposed to the weather like a load of coal.

The drivers of horses were of the slow going, slow thinking type, and cared little for weather conditions; but successful truck drivers are of a different, more intelligent type. They are called upon to make quick decisions and have levers to manipulate. Certainly the driving will be better done if the driver is not cold and wet. It seems incredible that a company will provide blankets for a $200 horse but no robe for a $20,000 driver.

Why are chauffeurs so plentiful and competent truck drivers so few? There are several reasons, but one is that intelligent drivers do not wish to expose their health to every chilling blast that blows. When they are laid up sick, their wages cease. But, as Adam Smith stated in "The Wealth of Nations" the more pleasant a trade was made, the less the salary needed to secure competent employees.



Sketch of Storm Curtain for Protection of Truck Driver

Showing the curtain in use and (dotted lines) rolled up in the cowl

At one time, the managers of the street car companies defended the open platforms of their cars, by claiming that the motormen were more alert when benumbed with cold than when comfortably warm. It has cost the traction companies quite a little to make the change, but the universal adoption of vestibuled street cars is significant evidence of modern progress, even in the case of the notoriously economical street railway companies.

If the driver is expected to make his own repairs, it is evident that the work will be more carefully done if the garage is heated. If a number of trucks are cared for by a repair department, it will be quite sufficient to heat the repair department.

When the motor is located under the seat or under the hood, it is easy to provide grids or gratings in place of the floor boards during the winter months. These would permit the heat from the motor to reach the driver, and the openings could be closed by the floor mat when desired. Or openings, with shutters, could be provided in the design of the truck.

While side doors for the driver's seat may be an unnecessary obstruction for a truck that makes many stops; still the use of a cowl dash will do much to protect both the driver and the instruments mounted on the dash, from the effects of rain and storm. In the case of trucks now in service, it is frequently easy to make a cowl for the dash of thin sheet steel, to be fastened to the dash with screws or bolts.

The inside of the cowl furnishes a convenient location for a waterproof lap robe, which can be rolled up and fastened within the cowl by a couple of short straps when not in use.

The utility of the windshield has often been questioned; certainly it is a disadvantage if it obstructs the driver's vision in any way. If one is used, it should be fitted with a rain vision attachment; for accidents caused by the driver's inability to see through the rain or snow-covered glass may prove an expensive liability for the truck owner.

The springs of a heavy truck often are so stiff that the empty truck is uncomfortably bumpy, and the driver regulates the speed of the truck to suit his own personal comfort rather than with due regard to economical running time. If pleasure cars, whose passengers travel over smooth roads for a brief hour or two, require 12-inch cushions; why not use comfortable cushions for the driver who handles the truck for 10 or 12 hours every day in the week. A deep cushion adds nothing to the running expenses of the car.

It is to the truck owner's advantage to keep the truck in service as many hours a day as possible but this running time is usually limited by the endurance of the driver rather than that of the truck. So it is important that none of the driver's energy should be diverted from the driving of the truck or the handling of its paying load.

The CCJ leads in circulation, advertising and prestige

Future of Truck Business in the Middle West

By W. D. MENG

SEVERAL factors help to brighten the future of the motor truck business in Kansas City and the West. The rapid increase in the business of local industries has meant in the last year or so a marked increase in the use of trucks; and this tendency, say the dealers, shows signs of being much accelerated as the utility of the trucks becomes evident. One of the surest prospects of increasing truck business is in the traffic between Kansas City, Mo., and the new industrial town of North Kansas City, reached by good roads and a splendid viaduct across the Missouri River. Several mail order and other distributing houses already have large establishments in North Kansas City and transport their goods by auto truck to several depots in Kansas City, Mo. The trucks also deliver to the retail customers of Kansas City. The Rumely Products Company, a great farm implement institution, has a distributing branch in North Kansas City, and its two-ton G. M. C. truck shown in the illustration makes at least one trip a day to each of the four depots in Kansas City, Mo. Smaller trucks make more frequent trips.

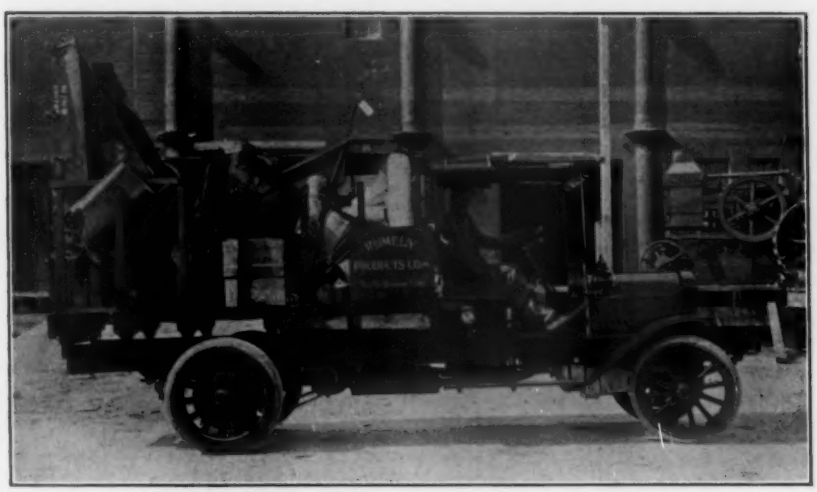
The splendid roads around Kansas City, Mo., offer especial inducements to the building up of the suburban residential and business communities. The motor truck serving both the suburbanites and the merchants of these small towns within 25 miles of Kansas City is proving a very important element in the development of such districts. The value of the truck is seen by both sides of the trade—the city merchant is in closer touch with his suburban customer and the country merchant is able to get his goods delivered more promptly and in better shape, as well as more economically from the city wholesaler. For 2 years the Rieger & Graham Transportation Company has pioneered in the delivery business to country stores in direct competition with the railroads. The success of this company is indicative of the large opening for the business. The company runs two Packard three-ton gasoline trucks, each making two trips a day in a radius of 26 miles. Kansas City retailers and wholesalers deliver goods to the company's headquarters. When a load is collected for a route or a town, one of the trucks is loaded for that destination. The company charges Western Classification rates, but the advantage of its service is in delivery to the door of the customer. There is also a distinct gain in time in the despatch of the goods to the truck company over getting it through the railroad freight depots. The small illustration shows one of the Packards, loaded for Lees Summit, leaving the supply depot.

Truck of Rieger & Graham Transportation Company

Still another phase of the suburban truck usage near Kansas City which is fast growing is the carriage of products of such institutions as dairies to city depots and the return with community freight. The illustration shows a G. M. C. truck used by the Holmes Dairy at Martin City for the bringing of milk to the firm's city milk depot. The truck, as shown, is loaded with freight for the return trip, the empty milk cans being piled on top.

Perhaps the largest future for the truck business in Kansas City territory has to do with trucks for farm use. The farmers have learned through the ownership of passenger automobiles the value of time and are eager to apply the economy and efficiency of motor vehicles to the carriage of their products to the market centers and the return of goods needed to their homes. An impressive indication of the growing use of motor vehicles and motor equipment on the farm is the big business done this summer, together with the large prospects, by the Bull Tractor Company, of Minneapolis, Minn.; Hall Brothers & Reeves Motor Company, of Kansas City, Mo., southwestern distributors, have placed several hundred machines in time to assist in the fall work on the farm and in the hauling of crops. Guy H. Hall, a member of the Kansas City firm, declared that the big future of the truck was on the farm. He and other members have traveled extensively in the past few weeks in Kansas, Missouri and Oklahoma attending state and county fairs and demonstrating the tractor. The farmers, he said, are very keen on trucks and tractors. The Kansas City branch house has twenty-five to one hundred fifty visitors each day getting pointers on the use of motor appliances, trucks and tractors. The ease with which power can be transmitted to other machinery from this tractor makes an especial appeal to the farmer.

A most interesting and instructive phase of truck usage in Kansas City is disclosed at the "Motor Delivery," 1820 Grand Avenue, Kansas City, Mo. This establishment is handled by Rode Brothers. The system is unique. Each driver owns his truck and has his own line of customers, developing his own trade. The calls that come into the office without designating a particular driver are assigned to the drivers in rotation as they report at the station. Among the requirements for admission to the organization are that the driver must be dependable and that he must own a Monitor truck. Ever since the business was started 7 years ago Monitor trucks have been the only ones used. They are fifteen hundred to one-ton machines. "Our experience," said J. Rode, "is that the smaller trucks are more economical and dependable than the big ones. We believe that two one-ton trucks are better for the delivery of a two-ton load than a two-ton truck. We figure the economy this way, the heavy truck must carry a helper to assist in unloading so that the time of the expensive truck will not be wasted. If two one-ton trucks are used for this delivery, the drivers can help each other, they can make faster time, the expense of upkeep will not be greater, and the chances on entire breakdown are much less." Mr. Rode suggested that their experience in securing work by bidding was probably the best proof that their theories were well founded. He also suggested that.



One of the Trucks of the Rumely Products Company
Used between Kansas City, Mo., and North Kansas City, a new industrial town

The CCJ is the only truck journal a member of the Audit Bureau of Circulation—Why?

The Holmes Dairy Truck

Used in bringing milk to city depot and freighting goods to rural community on return trip

while it might be easier to sell a big truck than two small ones, salesmen could show the prospective customer that two small ones were much more economical for certain purposes in the long run, quoting the experience of such establishments as the Motor Delivery.

The use of the motor trucks by farmers in the West is in its infancy, and R. E. Chamberlain, manager of the H. E. Wilcox Motor Company's Kansas City branch, covering western Missouri, Kansas and northern Arkansas and northern Oklahoma, is starting out this fall to develop that husky infant into a champion of the Wilcox truck. October 3 Mr. Chamberlain and his co-laborers started on a series of demonstrations through Kansas, showing the car in town Saturdays and on the days of the following week going after the prospects uncovered. "My idea," said Mr. Chamberlain, "is that trucks will be very widely used by farmers within 60 miles of local market centers. These trucks perhaps will be bought by individuals and employed in community transportation, the farmer doing his own hauling and the hauling for his neighbors. Perhaps these trucks will be mostly of the lighter kind—1000-lb. and ton trucks—convenient for substituting for the old-fashioned spring wagon, using two seats for family carriage and wagon bed for hauling. Many farmers, it is well known, now use their touring cars for freighting, putting the goods in the back. The widest usefulness of an auto vehicle on the farm is of course its commercial utility, and the tendency is, I believe, to buy motor vehicles from the standpoint of their commercial usefulness and adaptability to passenger traffic rather than, as in the past, from the other standpoint of adapting a passenger car to freight carriage.

WHAT IT COSTS TO KEEP A HORSE

To maintain and operate a horse and wagon has always seemed a simple problem. However, until truck owners come to pay special attention to motor trucks, and comparative operating figures were available, little was known as to the actual cost of such horse haulage.

The following table, showing the operating cost of a single and double team, is based upon a large Boston drayage business of 140 horses:

	1 Horse Per Day	Per Month	2 Horses Per Day	Per Month
Feed, oats per working horse per day	$0.449	$10.50	$0.898	$21.00
Feed, hay per working horse per day	.338	7.92	.676	15.84
Straw, 70 pounds per week	.100	3.00	.200	6.00
Hostlers, 10 men, at $2 per day, handle 140 horses	.143	4.29	.286	8.58
Shoeing, 1 set per month	.100	3.00	.200	6.00
Veterinary	.019	.57	.038	1.14
Horse depreciation, 5 years, at cost of $300	.167	5.00	.333	10.00
Interest on investment at 6 per cent	.050	1.50	.100	3.00
Wagon depreciation, 10 years' life, at cost of $250	.069	2.08	....	....
Wagon depreciation, 10 years' life, at cost of $500	....	....	.138	4.16
Interest on investment, at 6 per cent	.042	1.25	.084	2.50
Harness depreciation, $75 per team set, life 5 years	.021	.63	.042	1.25
Interest on investment, at 6 per cent	.006	.19	.012	.37
Stable, rent, space for stalls, feed and harness	.120	3.60	.240	7.20
Stable rent for wagon space	.120	3.60	.240	7.20
Wagon repairs and painting	.111	3.33	.222	6.66
Fire and accident insurance	.060	1.80	.120	3.60
Driver's pay per day	2 333	60.66	2.667	69.34
Foreman's and helpers' charges	.370	11.10	.740	22.20
Miscellaneous, water tax, ferry tolls, etc	.100	3.00	.200	6.00
	$4.718	$127.02	$7.436	$202.04

These figures show that it costs $4.72 per day to operate a one-horse truck, or $127.02 a month.

The cost of upkeep of a two-horse team is $7.44 per day, or $202.04 per month.

The figures given can be duplicated, only where a large stable is operated on a very economical basis.

If a man tells you he can operate his horses for less than the above amount, get him to check over the items shown, a number of which he has never taken into consideration.

Then produce the following comparison, which covers an average period of one year, showing:

Cost of Haulage by Motor and Horse-Drawn Wagons

Company	Place	Business	Truck	Motor Per Day	Horse Per Day
Indiana Market	Chicago	Meats	1 Gas	$7.17	$13.26
Spaulding & Spaulding	Buffalo	Coal	17 Gas	9.40	....*
Transit House Stores	Chicago	Meats	2 Gas	4.19	7.42
McMillan Co., J. T.	St. Paul	Packers	1 Gas	8.32	13.27
Perkins Co., H. J.	Springfield, Mass.	Produce	3 Gas	11.95	16.80
Rothschild Co., Maurice	Chicago	Dept. Store	6 Gas	16.20	33.00*
The Fair	Chicago	Dept. Store	52 Trks.	9.77	....*
		Average		$9.57	$16.75

*Horse cost not available.

Analysis of the above table shows average cost of operating motors is $9.57 per day. Average cost of doing equivalent work with horses is $16.75 a day, or a saving of 43 per cent. in favor of motor trucks over horses.

A horse must be fed, housed, maintained and cared for during 365 days, but to get his actual earning capacity, there should be a deduction of fifty-two Sundays and eight holidays, leaving 304 effective days. A horse's upkeep in idleness is just the same as in times of actual service.

The Electrical Commission of the City of Baltimore, has placed an unusual type of truck in service, which performs a number of duties in the maintenance of the municipal conduit system. This is a White truck and combines a vehicle for transporting repair crews and supplies, and embodies a pumping station, lighting plant, repair shop and a wireless equipment enabling the commission to keep in touch with the truck.

SMALL PAYMENTS BANE OF THE BUSINESS

Contract pirates have been unduly encouraged in one large city by a truck dealer's policy of putting out a very large number of vehicles to persons of limited responsibility on a policy of small payments down and small monthly payments. Many of these trucks have been sold to men who are in contracting, or cartage business, and in order to keep them busy all the time, they have cut rates and started a rate-cutting campaign which has brought the figures down to about half what they ought to be. As most of these men figured on the original and proper rates before they bought their trucks and put out their "paper," one of the shrewdest truck dealers in the country figures that there is bound to be some kind of a bad smash that will throw a lot of these trucks on the second-hand market at half price or lower, and create a chaotic condition which will last a year or two at least. Keen competition in the motor-truck industry is no reason for manufacturers relaxing or giving up the standards of ordinary business prudence, and buyers who encourage such a policy, and banks which permit it, are piling up trouble.

It is poor consolation for the owner of a truck, built by a concern which has gone broke and quit supplying service and repair parts, to figure that he made a saving in the purchase price of the truck, or spread the payments out over a very long time, when his repair bills in 2 or 3 months far exceed any advantage he could possibly figure for this method of doing business.

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Horse Power, Gears and Road Resistance in Motor Trucks With and Without Trailers

By H. KERR THOMAS, M. I. Mech. Engr.

THE trailer problem in connection with motor trucks is apt to offer such attractive inducements for increasing their hauling capacity that the difficulties arising from the underlying principles of the entire proposition are apt to be overlooked.

Many writers have employed the analogy of a locomotive to argue how advantageous must be the practice of hauling many vehicles by one power unit, having entirely overlooked the fact that there is no analogy whatever possible between hauling conditions on rails and on common roads. Three reasons immediately suggest themselves:

1. The rail is smooth and the road is the reverse. The tractive resistance for rails is about 9 lbs. per ton, while it averages for good roads, 75 lbs.

2. The gradients are entirely different. On railroads they are so carefully engineered that the gradients seldom exceed 1 per cent. On common roads, 10 per cent. is usual; 15 per cent. is not uncommon in certain districts, while 20 per cent. may occasionally be met with.

3. There is the immediate question of capacity load. A freight locomotive capable of hauling a heavy train is practically useless for hauling one or two cars, so a motor tractor, which is useful for four or five trailer vehicles, cannot be economically employed on one or two.

The selection of suitable powers and gear ratios for commercial vehicles involves certain considerations of first principles in order to insure a proper balancing of tractive effort and tractive resistance.

Tractive effort, of course, depends upon the horsepower, and horsepower is only a somewhat indirect and complicated method of measuring torque or the actual turning force of the motor. The torque furnished by a gasoline motor is not constant nor is it directly proportional to horsepower. Hence, it is important to consider not only the greatest possible horsepower of the motor in a commercial vehicle, but also the maximum torque, which is usually obtained at a much lower speed that the maximum horsepower. Hence, also, the fact which must not be overlooked, that speeding up a truck motor, unless steps are taken to increase the torque, will not increase its hill-climbing power, and it follows that if the motor be governed, it must be governed at a slightly higher speed than that which corresponds to the point of maximum torque if the best results are to be obtained, all of which is, of course, a matter for careful consideration at the hands of the designer.

A vehicle can ascend a hill by reason of the direct pull against the surface of the road, which may be described as the torque applied at the tire. The same vehicle is prevented from ascending the hill by the amount of gradient and the road resistance of the particular road on which it is traveling. The tractive effort of the wheels must, therefore, be slightly greater than the tractive resistance of the road in order that the vehicle may keep in motion. Let it be remembered that the tractive effort means torque at the road wheels and that the tractive resistance means a combination of gradient and rolling friction. Since the torque is provided by the motor, one must consider this quantity where it is first produced. If the horsepower at any speed is known, the torque may be found as follows:

$$\text{I.} \qquad T = \frac{BHP \times 33{,}000}{2\ \Pi\ Rn} \text{ lbs. ft.}$$

Where R = radius in feet, at which the torque is to be measured.
n = r.p.m. of motor.

Whence, at 1-ft. radius

$$\text{II.} \qquad T = \frac{BHP \times 5252}{n} \text{ lbs. ft.}$$

Hence, the moment of torque about the axis is expressed by

$$\text{III.} \qquad T = \frac{BHP \times 63{,}024}{n} \text{ in. lbs.}$$

which may be written sufficiently nearly

$$\text{IV.} \qquad T = \frac{63{,}000\ P}{n} \text{ in. lbs.}$$

This may be expressed as the moment of torque at the flywheel of the motor. It is multiplied by the figure corresponding to the gear ratio. Consequently, if

r = the total gear ratio, and
e = the mechanical efficiency,

then the moment of torque available at the road wheels is

$$T \times r \times e$$

and if d = the diameter of the road wheel in in., the torque at the wheel periphery is

$$\text{V.} \qquad T = \frac{63{,}000\ P\ r\ e}{\frac{n\ d}{2}} \text{ lbs.}$$

This figure is the measure of the tractive effort in pounds at the tire.

On a level road the tractive resistance is that due to rolling friction, and according to the nature of the surface may vary from 8 to 500 lbs. per ton (2000 lbs.). Thus, on a level road, in order that the vehicle may continue in motion,

$$\text{VI.} \qquad T = W \times \frac{R}{2000}$$

where W = the weight in lbs. of the vehicle, and R the road resistance.

In the case of a road on an incline, the total tractive resistance per ton may be expressed by the equation

$$\text{VII.} \qquad TS = R \cos a + 2000 \sin a$$

where TS = tractive resistance
R = resistance of road surface in lbs. per short ton
a = angle of gradient.

From this equation the following table is calculated for 1-lb. road resistance:

Table 1

Percentage of Grade.	TS per Ton. (2000 lbs.)
5	101.02
10	200.22
15	297.75
20	393.18
25	485.97
30	575.68
40	743.67
60	1029.94
80	1250.12
100	1414.927

Fig. 1 shows the graph of this series, and if the same be reproduced on a very large scale, it will be found that up to 25 per cent. it is practically a straight line for all grades. It is, therefore, possible to devise the following simple formula which expresses within very narrow limits the value of the tractive resistance on any grade not exceeding 25 per cent.:

$$\text{VIII.} \qquad TS = W \left(\frac{20g + R}{2000}\right)$$

Where W = weight of vehicle in lbs.
g = percentage of grade
R = road resistance in lbs. per short ton

We have seen that the tractive effort must be equal to the tractive resistance. That is to say

$$\text{IX.} \qquad T = TS$$

and by substituting from V and VIII, we get the following:

$$\text{X.} \qquad \frac{63{,}000\ P\ r\ e}{\frac{n\ d}{2}} = W \left(\frac{20g + R}{2000}\right)$$

Hence we may say that in order that any automobile may ascend a hill of grade g and road resistance R, the following equation must be satisfied:

$$\text{XI.} \qquad \frac{63{,}000\ P\ r\ e}{\frac{n\ d}{2}\ W \left(\frac{20g + R}{2000}\right)} = 1$$

Starting in with this as a basis, it is easy to obtain the specific value of any one of the factors if the others are known.

The subject of road resistance is one demanding much study, and very little exact information is at present available. On a

The CCJ has most readers because it gives most information

vehicle of known characteristics, perhaps the best method of measuring is by means of the accelerometer, which in skilled hands gives exceedingly accurate results. The following table gives some typical examples which are generally accepted as correct, but they must be taken with reservation:

	Per 2000 lbs.
Railroads	9
Good Asphalt	13.5
Asphalt	20
Poor Asphalt	26
Wood Paving	27
Good Setts	31
Best Macadam	40
Ordinary Macadam	50
Soft Macadam	95
Best Gravel	50
Good Cobbles	55
Ordinary Cobbles	120
Bad Cobbles	200
Dry Clay	100
Hard Sand	320
Loose Sand	500

Considering the tractive resistance further, it is evident that seeing that it is made up of the sum of the road resistance and the rolling friction, if one of these is increased, the other must be decreased in order that the total may remain constant.

The other point is that the road resistance which can be overcome varies inversely with the gross weight of the vehicle, and it is this circumstance which governs the whole question of the use of trailers. Some examples may best make this clear.

We will assume the truck of orthodox proportions, and see how it can be operated with and without trailers.

Rated capacity of truck = 5 tons.
P = 45
e = 85% on direct gear; 70% on low gear
N = 1000
d = 40 in.
W = 20,000 lbs.
r = 10, 15, 25, 40

We will first consider a truck running on the level, on high gear, over an ordinary asphalt road, where R = 20 lbs. per 2000. Substituting these values in equation IX, we get

$$\text{XII.}\quad \frac{63{,}000 \times 45 \times 10 \times .85}{1000 \times 20} = W\left(\frac{20g + R}{2000}\right)$$

Whence

$$\text{XIII.}\quad W\left(\frac{20g + R}{2000}\right) = 1205;\ \text{say } 1200$$

Since road is level; 20g = 0. Therefore,

$$\text{XIV.}\quad \frac{W \times 20}{2000} = 1200$$

Whence, W = 120,000 lbs.

The weight of the truck is 20,000 lbs., which leaves 100,000 lbs. as the weight that such a truck could draw on the level in the form of a trailer in addition to its own load.

Now, a trailer to carry 5 tons, weighs about 2 tons, or a gross weight of 7 tons or 14,000 lbs. Say

$$\frac{100{,}000}{14{,}000} = 7.15$$

or allowing for additional rolling resistance losses, at least six trailers could be drawn by such a truck, or a total useful load of 25 tons, which seems a highly attractive proposition.

Unfortunately, there is no such thing as a perfect asphalt road, and in a city, apparently perfectly flat to the eye, there are always grades of at least 5 per cent. to be encountered. The bracketed quantity in equation X therefore becomes

$$\frac{(20 \times 5) + 50}{2000} = \frac{150}{2000}$$

That is to say, that

$$\frac{150\ W}{2000} = 1200$$

Whence, W = 16,000, this being 20 per cent. less than the weight of the truck itself, shows that the truck cannot ascend even this moderate hill at all on high gear, and the imposing fleet of six trailers has vanished altogether.

Now suppose that we assume the conservative figure of one five-ton trailer, weighing 2 tons or 14,000 lbs. of trailed load. Added to the weight of the loaded truck, we have a total hauled load of 34,000 lbs. It is futile to suppose less than 5 per cent. gradients or a road resistance of less than 50 lbs. per ton. Let us see what gear ratio will be required under these circumstances. Substituting the known values in equation XI, we get

$$\frac{63{,}000 \times 45 \times .7 \times r}{1000 \times 20 \times 34{,}000\left(\frac{(20 \times 5 + 50)}{2000}\right)} = 1$$

From which we find that r = 25.7, so that the truck and its trailer would have to run on second speed. Under such circumstances the truck will be able to negotiate all places in a level city on the second gear with the five-ton trailer, and the same, of course, applies if there is much traffic congestion when second speed will have to be used when third ought to suffice; and if to avoid this, an extra low final reduction is provided, the vehicle is penalized on level ground.

At this stage it becomes apparent that we cannot any further neglect the time element, and we must, therefore, attack the problem from another point of view.

From what has already been said, it is clear that an ordinary truck cannot use a trailer at all, except in a very flat territory. Let us assume such a territory and, further, that the conditions of the hills and the traffic, using the truck alone, or a dead load of 20,000 lbs., necessitate running half the time on high gear and half the time on third, or a mean gear ratio of 12.5. From this we can find a value for the resistance factor. Thus

$$\frac{63{,}000 \times 45 \times 12.5 \times .7}{1000 \times 20 \times 20{,}000} = \frac{20g + R}{2000}$$

Whence,

$$\frac{20g + R}{2000} = .062$$

Therefore,

$$20g + R = .062 \times 2000 = 124$$

Taking all conditions into account, it is found that good roads furnish occasionally resistance of 75 lbs. per ton = R. Therefore, 20g = 124 − 75 = 49.

Therefore,

$$g = \frac{49}{20} = 2.45\%$$

which is indeed a very moderate hill.

Next assume that a trailer is taken over roads whose gradient surface resistance equals .062. The load will be 34,000 lbs., and we require to find the value of r.

$$\frac{63{,}000 \times 45 \times .7 \times r}{1000 \times 20 \times 34{,}000} = .062$$

Whence, r = 21.25.

It will be seen that this is almost a mean of second and third gears on the truck in question.

Now to return to the truck, it is seen that

(a) In one case it will run on a mean gear ratio of 12.5.

(b) In another case it will run on a mean gear ratio of 21.25.

In case (a) the number of revolutions of the motor per mile will be

$$\frac{1760 \times 3 \times 12.5}{\frac{40\ \Pi}{12}} = 6312$$

In case (b),

$$\frac{1760 \times 3 \times 21.25}{\frac{40\ \Pi}{12}} = 10{,}740$$

Each revolution of the motor consumes a definite quantity of gasoline. Hence, the gasoline in case (b) has risen 70 per cent. It is evident, too, that the time has increased at the same rate. Hence, all standing charges have risen, but double the load is carried.

In other words, we have done 200 per cent. of the work at a cost of 170 per cent. Therefore, the net cost per ton is

$$\frac{170}{200} = 85 \text{ per cent.}$$

when the trailer is used.

We have, however, not taken account of one very important factor. It is within everyone's knowledge that the upkeep of tires is the most expensive item in the cost of running, but we have the tires subjected to a constant strain 70 per cent. higher than it ought to be, and it is easy to see that the tire maintenance will be disproportionate. In other words, that the maintenance of the five-ton truck will become greater in a way which cannot be computed, and together all the other costs of maintenance will increase. The gross saving of 15 per cent., therefore, will not work out in practice, and when the other figures are taken into consideration, it will be found to shrink very badly. Moreover, we have seen that even to show such a saving, we have had to assume a road which, so far as the writer's knowledge goes, does not exist. No city has gradients limited to 2 per cent.

The CCJ has most advertisers because it gives them biggest returns

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The same overhead expense with broader selling radius and more customers—this fundamental of better business is yours with the aid of Firestone

Truck Tire Equipment

Not only actual cash saving in Most Miles per Dollar, but the deeper economy of Most Miles per Day—their dependability—allows your trucks to go farther and at a lower cost.

Firestone Removable Rims built to S. A. E. Standard, are handled so easily by your own drivers that delays are reduced to a few minutes, and tire trouble is eliminated. Service stations in all large cities. Write for catalog.

Firestone Tire & Rubber Company, Akron, Ohio—Branches and Dealers Everywhere

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Pneumatic Tires, Truck Tires, Pleasure Electric Tires, Carriage Tires, Cycle Tires, Fire Apparatus Tires, Rims, Tire Accessories, Etc.

Firestone

Again, if the radiators of existing trucks are examined scientifically, it will be found that by common consent they are capable of handling about 50 per cent. of the heat rejected in the cooling water when the motor is run under maximum full load conditions, and no standard form of truck has ever yet been made which is intended to have its motor run at maximum horsepower always, and it is not too much to say that there is no truck which could survive such an ordeal. To attempt to assign specific values under all working conditions is to invade the realm of speculation, but enough has been said to show that only under what may be termed ideal conditions, never met with in practice, can trailers be economically used with what at present constitutes the standard design of truck.

The misconception regarding the use of trailers arises from the mistake of not distinguishing between a tractor and a motor truck. A motor truck is primarily designed to carry its own load and an orthodox truck has by common consent a motor of a certain size with a certain gear ratio for a predetermined load. In other words, there is a great unanimity between manufacturers as to the cylinder volume required per thousand lbs. of load moved 1 ft., and an examination of nine leading trucks of American and European manufacture shows the following average values:

	Cylinder Capacity in Liters, per Thousand lbs., Moved 1 ft.
First Speed	1.188
Second Speed	.612
Third Speed	.431
Fourth Speed	.288

or in cu. in.:

First Speed	72½
Second Speed	37.3
Third Speed	26.3
Fourth Speed	17.6

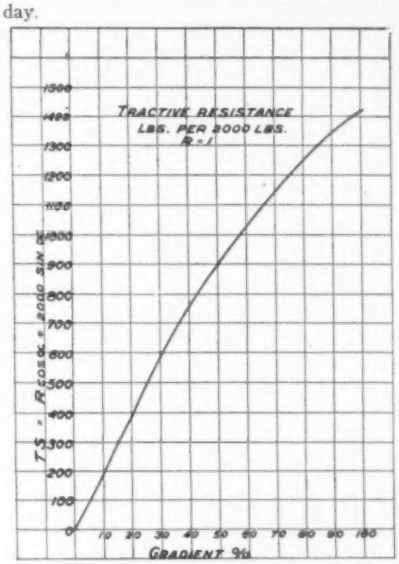
In the case of the hypothetical truck already considered, we have the following:

Horsepower, 40.
Motor dimensions, 5x6, 4 cylinders.
Total volume, 7.7 liters or 470 cu. in.

Then cylinder capacity per thousand lbs. moved 1 ft. will be

	Liters	Cu. In.
First Speed	1.475	90
Second Speed	.920	56
Third Speed	.550	33.5
Fourth Speed	.368	22.5

If these be compared with the averages just given, it will be seen that in the assumed case from which the examples have been, calculated, we have actually a larger reserve of power and, consequently, hill-climbing ability than the average trucks by the best-known makers on the market today.



It is to be noted that nothing is proved by the preceding remarks against the use of tractors properly so called. It is easy enough to design a machine which will give excellent and economical results, but such a machine is not properly a motor truck, and the conclusions are:

1. The standard motor truck cannot with economy be regularly used with a trailer, no matter what the conditions.

2. If the use of a fleet of motor trucks is apparently indicated, greater economy will be secured by paying careful attention to proper organization, and loading and unloading a regular motor truck rather than by attempting to make it carry more freight by separating the extra load on a trailer.

3. The mistake of overloading a truck is now generally recognized. Overloading which overtaxes the motor and tires is just as shortsighted as that which overstresses the frame and springs. In the long run the results are the same, and that any economy will result is mere delusion.

4. If conditions warrant the use of road trains, proper tractors may be built for the purpose, but they will only show economy when operating at or about their full loaded capacity. In the writer's opinion, the only kind of machine which would be really serviceable as a tractor would be a gas-electric power plant with separately driven units for the train. Only in this way could a proper balance be arrived at between power and load.

DONT'S FOR DEALERS

Don't brag.

Don't misrepresent.

Don't make yourself annoying to a prospective buyer.

Don't attempt to sell a truck to a merchant who cannot keep a one-horse wagon busy.

Don't sell a four-ton truck for service that a one-ton truck can fill.

Don't deceive your customer in a single instance, for sooner or later he will find it out.

Don't "knock" your competitor and his truck, for he will be apt to treat you much in the same manner.

Don't try to make your customer think that your truck is the only one in existence, but show him where yours is best for his particular needs.

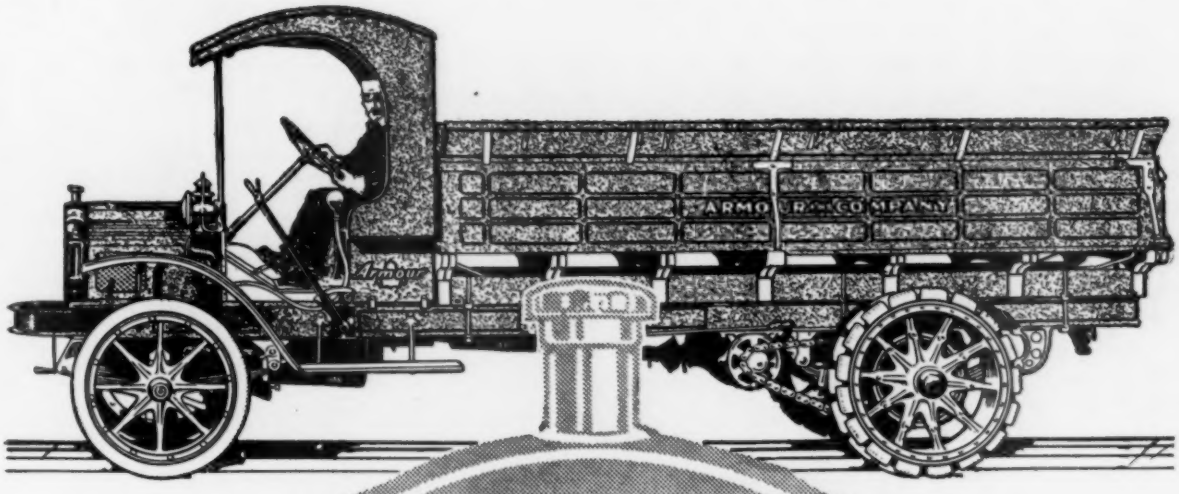
Don't lose your customer's confidence and respect if you expect to hold his trade and make further sales to him or his fellow merchants.

The wheels of progress turn more easily when motor-driven

Two-Ton G. V. Electric Used by the Southern California Edison Company, for Hauling Poles, Raising Heavy Transformers to Tops of Poles, With Special Tackle, and Other Heavy Gang Work

Equipped with a bolster and "Dolly" trailer, it will haul as many as seven 40 ft. poles weighing 1400 lbs. each. The poles are adjusted so that little weight comes on the truck, its function being more to supply the traction. With a moderate load of poles the front half of the body is loaded with wire, crossarms, insulators and line material, and may carry as many as four men, giving a load up to one ton.

The CCJ leads in circulation, advertising and prestige



FAMOUS PACKING COMPANIES OWN GREAT WHITE FLEETS

RECENT purchases by Armour & Company have brought the total of their White Trucks to sixty-six, operated in thirty-five cities throughout the United States.

Armour & Company purchased their first White Truck in 1911, and have steadily added to their White equipment during the last three years, until now their White Fleet is numbered among the large installations of the country.

White Trucks are being used to solve the transportation and delivery problems of many of America's great packing companies. Besides Armour & Company, White Truck Fleets are owned by the Cudahy Packing Company, John Morrell & Company, Swift Canadian Company, Cleveland Provision Company, and many others.

In transporting the perishable products of these companies, absolute reliability is essential. White Trucks are giving this kind of service, day after day, and year after year, in all lines of business.

THE WHITE COMPANY
CLEVELAND

BOTH IN QUANTITY AND VALUE OF PRODUCTION, THE LARGEST MANUFACTURERS OF COMMERCIAL MOTOR VEHICLES IN AMERICA

BUSHINGS: THE IMPORTANT PART THEY PLAY IN THE COST OF OPERATING AND MAINTAINING MOTOR TRUCKS

By JOHN W. WATSON

Members of the Society of Automobile Engineers; President of the American Bronze Company, Berwyn, Pennsylvania

The problem of every man or concern operating motor vehicles, whether for the delivery of goods or for the transportation of passengers, is to keep these vehicles on the road where they earn money and out of the shop where they cost money.

To have a fleet of six trucks or six taxicabs and average but five of them on the road and one of them in the shop is certainly not very encouraging to the man having invested his money in these six vehicles for business purposes.

Why is it that these cars must be laid up for overhauling? The answer is found in one big word—wear. If there was never any wear there would be mighty few interruptions to continuous service. The occasional breaking of some part would be all that could then interrupt service and entail expense.

Wear, though, we will always have. Between any two moving parts there is always friction and friction causes wear to a degree dependent upon the quality of the metals in contact with one another.

The bulk of parts in the make-up of any motor vehicle are in no way subjected to wear, there being no movement between these parts and the parts to which they are bolted. Let us analyze and see what parts are subjected to wear in motor vehicles. As the writer analyzes a motor vehicle its wear-subjected parts may be classified under four headings. Gears, ball and roller bearings, plain bearings (split and therefore adjustable for wear), bushings (solid and therefore non-adjustable for wear).

Let us now analyze a little further and see how these wear-subjected parts balance up with one another. If they all lasted for the same length of time the car would not have to be laid up for an overhauling until all of these parts were down and out. This would be a long time indeed and any such car would prove a wonderfully profitable investment.

It so happens, though, that these four classes of wear-subjected parts, in many cars at least, come no where near balancing one another in length of service given. Let us separately analyze the wear resisting qualities and the average life of the parts under each of these headings. First let us take up the gears. There are motor gears, pump gears, steering gears, transmission gears, bevel gears, differential gears, etc. Present-day science in the alloying of steels and in the heat treatment of steels combined with present-day accuracy in the cutting of gear teeth renders these gear parts practically immune from wear. And even after years of service, when the gear teeth may have shown a little wear, there is no lost motion between the driving and the driven gear as long as the power is on. When the power is on the gear teeth are just as snugly up against one another after wear has taken place as they were when the gears were new. If gears were the only parts which necessitated the overhauling of a car there would be few cars indeed requiring overhauling.

Now let us take up the ball and roller bearings. These bearings, because of the very fact that they run with so little friction and therefore show so little wear, are used in motor cars wherever construction will permit. The reason ball and roller bearings run with so little friction and show so little wear is because this type of bearing gives a rolling and not a sliding action. Present-day ball and roller bearings give such long and satisfactory service that the average car owner never even finds out where they are located. Breakage, due to a defective ball, a defective roller or a defective race is practically the only circumstance which will send a car to the shop for the renewal of these parts. And defects in ball and roller bearings in these days are rare indeed.

Now we come to the heading of split, and therefore adjustable, plain bearings. These plain split bearings, in most cars of present design, are found only on the main motor crank shaft. There are the three or more main crank shaft bearings and the four or six crank pin bearings. These bearings after a year or two of service show wear, but by simply dropping the oil case under the motor and removing a shim or two between the two halves of the worn bearings this wear is quickly taken up and the bearings are then ready to give another year or two of perfect service. This work does not involve the dismantling of any of the other parts of the car and is done at very little cost in a very short time by any average mechanic. It takes many years of hard service to wear these bearings down to the point where their renewal is made necessary.

Now we come to the last of the four headings of wear-subjected parts. This heading covers the solid non-adjustable bushings. These bushings are found here, there and everywhere, throughout the whole car. There are the wrist pin bushings, cam shaft bushings, magneto and pump shaft bushings, idler gear bushings, oil pump bushings, valve plunger guides, steering gear bushings, front axle steering knuckle bushings, clutch bushings, two or three bushings in the transmission, universal joint bushings, differential pinion bushings, etc.

When new, these bushings are purposely fitted snugly to their respective shafts. These bushings must be snug in order to hold these shafts in their correct alignment. We have a sliding and not a rolling contact in these bushings and we therefore have friction and this friction means wear. We have the same kind of friction that we have on the main crank shaft bearings, but these bushings, unlike the main crank shaft bearings, are not split and wear on them therefore can in no way be taken up. When the bushings have worn down even as little as two or three thousandths of an inch, less than the thickness of this page, their period of usefulness is over and their renewal is demanded.

These solid non-adjustable bushings therefore are the parts which are sadly out of balance with the other three classes of wear-subjected parts. All of the other parts are still giving perfect service and are therefore just as good as new, and yet the car must be taken out of service, put in the shop and torn to pieces for the renewal of those bushings which have worn to the point where their renewal is demanded. And it isn't as if all of the solid bushings wore down to this point at the same time and thus make it possible to renew them all at one tearing down. It often happens, because of lack of uniformity in bushing materials, that even bushings subjected to the same duty will not give the same length of service. In hundreds and hundreds of cases it happens that one piston pin bushing will be worn to the point of producing a bad knock before the other three piston pin bushings have shown any wear at all. And it takes just as much time and costs practically the same amount of money to renew this one bushing as it would to renew all four of them. To renew any one or more of these solid non-adjustable bushings generally means the dismantling of some entire unit—the motor, the transmission, the rear axle or some one of the several other units.

How important it is then that bushing material should be right and should be uniformly right.

Inferior bushings will spell disaster to the otherwise finest of motor vehicles and superior bushings will make balanced and economical service givers out of otherwise medium grade vehicles.

In view of the foregoing analysis as to what groups of parts are subjected to wear and then as to which of these groups will logically show first wear and require first renewal, it is clearly seen wherein lies a manufacturer's open road to vastly lessen the up-keep cost of his cars and to thus greatly increase their value. And purchasers of motor vehicles are wise to insist upon learning all that is to be learned about materials for these bushing duties and about the bushing materials which are used in the various makes of cars which are being demonstrated to them.

It is important that a car demonstrate its ability to carry the load and negotiate the hill, but it is also vastly important that the car will continue to carry the load and negotiate the hill.

In the manufacture or purchase of a commercial vehicle it is well to always keep in mind that the value of this vehicle lies in its being on the road where it earns money and out of the shop where it costs money.

Armored French Auto for Transporting Aeroplanes

The CCJ is the only truck journal a member of the Audit Bureau of Circulation—Why?

IN WHAT WAY HAS THE DRIVER OF THE TRUCK INTERFERED WITH THE SALE OF TRUCKS

(Continued from page 19)

Many of the abuses for which the operator is blamed are traceable directly to bad salesmanship, as Mr. Hare has already pointed out but it is my province to bring to your attention some of these abuses and suggest means by which they can be eliminated.

Who among us but can point to many an instance within our own knowledge where there are two trucks of the same model and capacity doing the same kind of work. One of these trucks is operated at a minimum of expense with practically no delays while the other is constantly out of commission and mounting up large repair bills to stir the wrath of the owner. There can be but one answer to this condition—the operator, whether it be the owner or the paid driver.

It is probably the experience of most of us that the owners of large fleets of trucks have reduced the trouble and expense problem to a minimum. They have learned their lesson and fortunately have had the acumen not to blame the trucks but to place the trouble where it belongs and have corrected their own early blunders. There may be some few exceptions to this but it will generally be found to be the rule. It is therefore largely in the study of the small owners—of from one to three trucks who are largely in the majority both as present and prospective owners, that we must turn in our endeavor to solve this problem.

It is needless to take up much of your time by elaborating on many of these abuses with which we are all only too familiar. Suffice it therefore to but enumerate some of the most common abuses such as overloading, overspeeding coasting down hills at 25 miles an hour with a truck geared to make 12 miles and then throwing in the clutch at the foot of the hill with the consequent terrific strain on the entire machine lack of proper lubrication and in fact an entire lack of that kind of inspection, care and attention to which any piece of machinery which is worked constantly and to its capacity is entitled. We all know of these abuses but it is our problem to trace out the causes or reasons for their existance and then to work together for their elimination.

Bad drivers you say. Certainly it is bad drivers but why are they allowed to handle expensive and more or less delicate pieces of machinery through congested traffic and over our municipal highways. It appears almost as if the average purchaser of a motor truck used about the same intelligence as is told of a rural Congressman who upon making his first visit to Washington and finding himself somewhat outside the golden circle, sought the companionship of one of the attendants in the capitol of whom he enquired as to the program for the coming session. The attendant confessed that he was a new man and knew little outside of his own work, whereupon the dully elected representative from the back country district, anxious to make a hit with somebody in Washington replied: "Ah, then I can talk to you intelligently."

It is almost incomprehensible that the same firm which employs skilled licensed engineers for the operation of stationary engines in their plants, will purchase a motor truck and immediately place it in the hands of an unskilled twelve-dollar-a-week man and expect to get satisfactory results. Yet this happens only too often. Probably not one out of three trucks operating in Philadelphia after a hard day's work receives a thorough looking over, a tightening of loose bolts and bearings and is oiled and made ready for the morrow, and yet there is not a locomotive anywhere on any of our great trunk lines that is not at least once a day run into a round house somewhere and put in prime condition for the next day's run by a corps of experts. The one is operated over smooth, steel rails by an expert engineer while the other is pounded over cobble stones and rough street crossings and abused in a dozen ways by a twelve-dollar-a-week driver. Is there any fairness in this condition and yet this is one of the conditions under which all our trucks are expected to make good and if they fail, are cast aside and condemned.

But we as sponsors for our goods must not think ourselves wholly blameless for some of these abuses. Happily the demonstration evil is a matter largely of the past and yet it is a fact that many an instance of overloading and overspeeding is traceable directly to our own employee—to our expert demonstrator—who when sent out to demonstrate is so anxious to outstrip his competitors that he permits the truck to be overloaded and then turns it into a race horse to make a record. The purchaser takes his cue from the demonstration and sees no reason why he should not continue the same tactics and without even the redeeming feature of having an expert behind the wheel. Then there is the spirit of graft—graft with the driver or owner or trusted employee for which the truck concerns themselves are wholly responsible. And along with this is the levying of blackmail by the driver or owner, the man who says if you don't take care of me either in the way of free replacements or a nice piece of change, I'll see that Jones & Company don't buy your truck. And they sometimes get away with it. Fortunately both of these iniquitous practices are not general but there is still sufficient of them going on to create disaffection and trouble. If every executive, salesman and employee would let it be known that no grafting or levying of blackmail of any description would be tolerated by his company, this evil would be quickly and effectually stamped out.

But to get back to the main point, that of the abuse of the operator. It appears to be conclusively proven that these abuses to a considerable extent result from the failure of the firm making the sale to impress upon the purchaser the necessity of employing competent drivers, men of intelligence who are capable of earning and should receive reasonable compensation for the skilled work they are employed to perform and who will put dollars in the pockets, of their employers by the careful and intelligent handling of their property. This condition can be greatly improved in the future by united action in making this a definite and fixed part of our sales policy. As a means of correcting this condition with those firms already owing and operating motor trucks, our president has suggested that at some future meeting we invite as our guests the owners and drivers of our machines and that we then discuss with them the proper care of these vehicles and drive home to them in an inoffensive but nevertheless forceful manner wherein they have failed in securing the best results through bad handling and abuse. If at such a meeting we can confine ourselves and our guests to a discussion of this one subject much good will undoubtedly result and it is probable that some feasible and economic plan will be worked out for bringing the owners and drivers together with us. It has also been suggested that as a means to counteract a growing impression among owners that every service plant and repair shop conducted by motor truck distributors is operated by a crowd of thieves and robbers who do not hesitate in piling up unreasonable and exorbitant bills in the repairing of machines that a clearing house committee be selected by this association to investigate cases of this kind as they arise and who shall pass upon the charges made and whose decision shall be final. This committee needs to be most carefully selected and should consist of men of unquestioned fairness, broad mindedness and integrity and we have plenty of this type within our own ranks.

Another most excellent suggestion for the elimination of driving abuses, is that every man of this organization constitute himself a committee of one to jot down every instance which he may note of the abuse of any motor truck and immediately report same to our energetic and hustling secretary, who in turn, acting in his official capacity, will notify the owner of this abuse. It is obvious that a systematic carrying out of such a plan would bring far-reaching results and would, from the very non-partisan spirit of the report, produce far better results than if handled directly by the distributors themselves, as an individual company.

The whole solution to this most serious problem appears to simmer itself down to one great fundamental idea—Education—education of ourselves and every salesman and employee in the proper sale, care and handling of our vehicles so that we may intelligently and persistantly drill into the minds of the past and future purchasers and operators their very important part in the successful solution of their delivery problems which we know can only be accomplished through the medium of motor trucks properly bought and rightly handled.

This association has already accomplished a unity of purpose and a desire for co-operation each with the other, and with the intelligent carrying out of this co-operation for the elimination of operating abuses, we will have accomplished that for which we are all striving—MORE, EASIER and BETTER SALES.

But let us never lose sight of the fact that this calls for the same broad mindedness which has long since been inculcated into every other successful industry and that it is not enough that we as individuals sell our goods we must collectively keep them sold.

(E. M. Bartlett's paper follows. See next page.)

The CCJ brings greatest returns to advertisers because of largest circulation among quantity buyers

WHY HAVE WE NOT MORE SUPPORT FROM THE OWNER OF THE TRUCK, AND BETTER RECOMMENDATION OF TRUCKS FROM HIM?

By E. M. BARTLETT

THIS third question has been pretty generally and thoroughly answered by my colleagues, Messrs. Hare and Eastman, and there is but little left for me to say.

It appears that the motor truck industry in the City of Philadelphia is in anything but a healthy condition. It is up to us as individuals and members of this truck association to determine, if possible, the cause and to suggest and carry out any remedies that may seem worthy of our consideration.

From a canvass recently made of very nearly fifty truck owners I have been able to get information, which is not only interesting but instructive. I find some owners who state frankly that unless they can operate their trucks at a less expense, they are in danger of becoming bankrupt, others there are who have about decided to go back to horses. The number of truck owners who are in a perfectly satisfied condition are decidedly in the minority, this applies largely to the large truck user, who is, as a rule, pretty thoroughly satisfied for reasons already mentioned with individual or company who owns and operates from one to three trucks we find the most contentious.

It is useless for me to occupy time going over ground that has been so thoroughly and ably covered in the remarks of the previous speakers. I think without doubt that all of us are pretty familiar with the troubles, which are peculiar to the truck conditions of to-day.

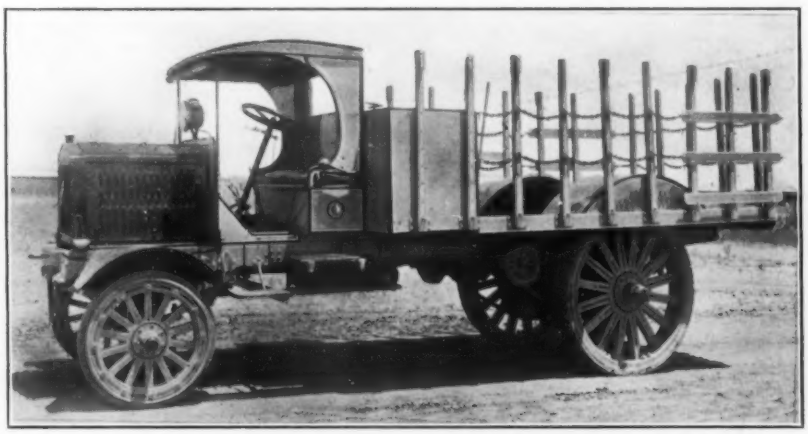
It is therefore of more interest to us and approaches almost a condition of self-preservation, so that it is important to decide on what remedy or remedies there are, that may be applied to relieve or improve the situation.

Whether the salesman selling trucks on commission is responsible for a portion of this condition or not, is an open question. By that I mean that in his over anxiousness to make the sale, all good business principles have been cast aside, having in mind only the commission which would be paid on making the sale, regardless of whether the truck stays sold or not. This method not only reflects discredit on the company who made and sold the particular truck, but is instrumental in laying the whole industry open to criticism.

I firmly believe that the biggest factor upon which can be placed the majority of the blame for the existing trouble, is in the various and sundry guarantees which are promiscuously handed out, with very nearly every truck sold. If we will stop to consider for a moment the absurdity of these guarantees in comparison with other lines of business we cannot but help realize that the existing condition is but the natural outcome of such a method. I personally know it to be a fact that a number of Philadelphia truck branches, or agencies, are, or have been, giving guarantees in order to make sales, which were so absurd on their face that it is surprising a business man was at all impressed.

If you purchase two articles of apparently the same class and type, which are intended to do the same work, one of which is guaranteed and the other is not, to which is given the more care and attention? In purchasing merchandise in a general way, if I come across an article that is plastered all over with guarantees I immediately commence to look to see what the matter is with it, being quite sure that something must be wrong or else a guarantee would not be needed.

In conclusion, I will venture to predict that when we are able to sell our cars without misrepresentation, and will eliminate all guarantees, leaving only what naturally goes with a reputable house dispensing high-class merchandise, when we are able to hit upon a plan, of controlling those selling our trucks in such a manner that when a car is sold it will produce a satisfied customer, when we get sufficient strength and confidence in, and with, this truck association to warrant the feasibility of organizing a clearing house, composed of some of its members for the purpose of assisting and regulating motor truck business in general, when we arrive at a state of mind whereby the foolishness of statements which can only undermine the confidence of a great majority of those whom we are trying to interest in trucks, is appreciated, and done away with and when the salesman who peddles absurd and untrue statements, such as a story in circulation about the parts of a certain well-known truck costing $17,000, is considered unsafe to have on our payrolls, then we will have automatically eliminated to a large extent some of the disparaging existing conditions with which we are now contending.



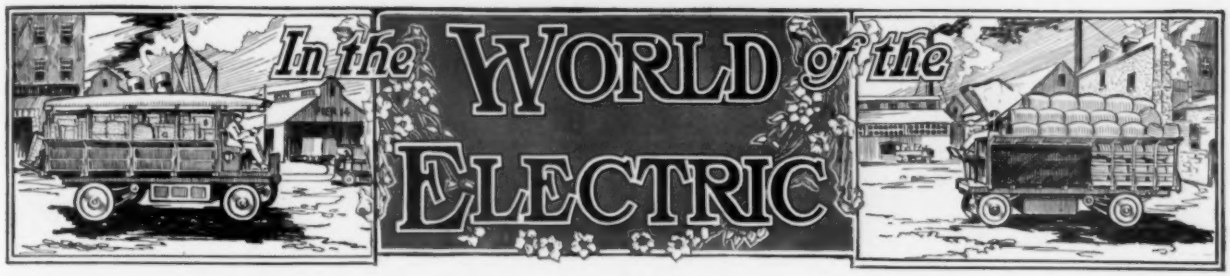
Special Wichita Mining Truck as Used in Colorado and Utah

Ideal for severe road conditions where great road clearance is required in fording streams, getting through soft spots and deep snow. Capacity 3½ tons, with rear wheels 56 in. in diameter and shod with 8 in. cast-steel corrugated tires. Front wheels 36 x 5, with solid rubber tires; upper ends of stakes provided with pockets for detachable bow top. Body platform 13 ft. long 7 ft. wide, with 14 in. wheel houses. This truck is especially designed for mining companies, for long and heavy hauls.

Four of the Six Lippard-Stewarts Now in the Service of the Shults Bread Company, New York

These machines are employed in suburban delivery on Long Island and travel about fifty miles a day each. They are one and a half ton worm-drive type. An order of three more has been placed. Sipe cushion wheels are used.

The CCJ has most readers because it gives most information



THE INFLUENCE OF THE PIONEER SPIRIT ON ELECTRIC VEHICLE PROGRESS*

THE early history of storage battery development concerns two big companies—the Consolidated Storage Battery Company which brought the Julius battery from Europe and purchased the Brush patents in this country and the Accumulator Storage Battery Company which brought the Faure batteries to this country in 1886. These two companies were soon involved in long and costly patent litigation. Each sued the other and each had its patents sustained. The factories of both were therefore shut up by 1891. The little storage battery factory which I started was also shut up by the same litigation.

The Accumulator Company then retained me as engineer with a view to avoiding the infringement of other patents and to study and investigate possible applications of the storage battery. We did not know at that time what good they were, if they were not used in street cars. About the first application that suggested itself was electric vehicles. A great French engineer (Hospitalier) published a paper in 1891 conclusively proving it impossible to run a vehicle with batteries that would go up a 7 per cent. grade in a road. This could not be refuted for the reason that nobody had tried it, and the first electric vehicle that I saw was in 1891.

In the winter of 1898, the Accumulator Company began to build twelve electric omnibuses for service in Washington, the people there being unable to obtain a franchise for laying tracks in the city streets. The first one of these put into service was so bad that the other eleven were never built. But we got a little experience.

About that time the Electric Storage Battery Company, of Philadelphia came into existence, bringing from Europe the chloride battery which was not supposed to infringe the patents in this country. Both of the old companies jumped on them and shut them up. It was then becoming apparent that the only way to accomplish anything was to get together, and all three companies were merged together as the Electric Storage Battery Company in 1894.

The engineers in the Consolidated Battery Company, Morris and Salom, wanted something to do. I had not gotten into the Storage Battery Company then. They told the Storage Battery Company that something ought to be done in the way of exploiting the electric vehicle and said they would work up this business. That was in 1893.

Meantime, while this get together movement was going on I started the Plante Company, which sold out in 1895 to the Electric Storage Battery Company. In 1896 or 1897 the Morris and Salom developments crystallized in the Electric Wagon Company, which put into service uptown a dozen cabs and ran them two seasons.

The first motive in the development of the electric vehicle was the desire on the part of the storage battery companies to find a market for their product; the second motive was public praise. Everybody wanted to ride in, hire or buy an electric vehicle or buy stock in a company. The Electric Vehicle Company was organized and put into operation fifty cabs in New York. So popular was the stock that it was hardly possible to organize companies with enough stock to go around without hurting somebody's feelings. There were the New York Transportation Company, the New England, Illinois, Washington and other companies. About seventy million dollars were invested in the industry, of which eight millions were paid in cash to the Electric Vehicle Company. The public wanted the electric vehicle.

In 1899 the Pope Company, of which I was president, got into the game and bought a plant at Hartford. We put through one order for 1600 electric cabs. We had about 4000 other electric vehicles going through the shops at Hartford. This was indeed quantity production for those days. We had not been under way long before we found the product no good. Tires had not been developed; we had only single tube tires which ran about two or three hundred miles and other parts were very imperfect. The public interest in financing the industry was disappointed. Engineering had not all been done, even though we had the money. The industry collapsed in 1900, the companies were liquidated and I got out. That was the end of the second impulse, the impulse from the desire of the public for an automobile.

Then came the dark ages of the business. In 1901 I still felt that there was something in it and wanted to see it through. About that time I met Lucius T. Gibbs, who had some good ideas in regard to electric trucks, and together we backed a company called the Vehicle Equipment Company and started making trucks.

There were in this country at that time six thousand wagon builders who wanted to get a chassis and then build the body and the rest of the vehicle. So we thought we could build the running gears and the chassis and sell them to the wagon builders. We rented a place in Brooklyn and started forty vehicles. By the time we were ready to dispose of them the wagon builders had changed their minds and we could not sell one of them.

We had to make good, so we developed larger works, went into the wagon business and tried to sell to the trade. That went on for almost 6 years. In 1905, the Vehicle Equipment Company put out a thousand vehicles. The company had gone through all sorts of vicissitudes, even bankruptcy, and was reorganized as the General Vehicle Company, but even as late as 1908, we were still in the dark ages. We got lots of sympathy, but no co-operation. Finally they talked about an electric vehicle man as somebody who was a little "off." Everybody had lost faith in the electric vehicle. Battery manufacturers did not believe in it. Motor manufacturers, big as they were, gave it up as a bad job. The electric light companies were skeptical.

In the early part of 1908 a great many improvements were made in the construction of the vehicle. Better tires, bearings, etc., made it possible to produce electric vehicles which really made good. Letters began to go through the mail regarding the economy and advantages of these wagons over the gasoline truck and the business became an industry. At the end of 1908 the pioneer phase was over.

The next real impulse the business got was from the electric light companies due to their desire to increase the field for consumption of current, and that was the last and was really the prime motive in the organization of this society. So you see the manufacturers of batteries, manufacturers of motors and public utilities have all been working together to make this a success. After the first and second impulse I do not know just how the business got along in the dark ages or what kept it going. Woods, Baker, Studebaker and others hung along, all feeling somewhat discouraged but putting up a hard fight.

I made up my mind in 1901 that the electric vehicle was a possibility and could be made a power in the world, and I determined to see it through. I assure you that there were lots of men around me and on deck to-day who were working for something besides the salaries they got. They felt that they were enlisted which demanded devotion and real sacrifice. We were all pioneers together, salesmen, producers, engineer, in that business. We were proud that we had accomplished something, though not as much as we expected, coming nearer and nearer to what we aimed at. That spirit still holds good with all the men who were connected with the business.

Of course you are not interested in this ancient history and I believe you are more interested in the present and the future. I do not believe in any one man or any one idea. All men and all ideas working together can obtain better results. I believe that the little special wagon will help the big truck and that the big truck will help the little truck, and that they will both help the pleasure car. I believe that all these interests working together will produce something better in the way of the electric vehicle. The electric vehicle of to-day is good, but we cannot stop now. We must go on making improvements, small, but in a few years they will have so multiplied that the vehicle of that day will be a vast improvement over the present. Our inspiration is in the future and we must not stand still, but have some faith in the coming great improvements and achievements.

I am sure that I can predict it; I know it is coming, and if we work together in 10 years most of the 60,000 horse vehicles will be displaced by electric vehicles, and we shall see a substantial number of pleasure vehicles running side by side with them."

*Address by R. McAllister Lloyd, before the New York Section of the E. V. A., on November 17th.

The CCJ has most advertisers because it gives them biggest returns

Baker Five-Ton Electric Trucks

BAKER Motor Vehicle Company, of Cleveland, Ohio, is making deliveries of its Model EA heavy truck which has a useful load capacity of 5 tons. The complete Baker truck line now consists of five sizes, ranging from ½ ton to 5 tons inclusive.

This model is designed to meet the increasing heavy truck requirements developing in the brewery, milling, coal, cotton, contracting and other industries where heavy goods are handled over city streets. The general design is similar to that used in other Baker trucks and conforms to what may be known as standard practice in electric truck design. The wheelbase is 137 in. with 72 in. tread. A solid rubber tire equipment of improved electric compound is used, the front wheels being equipped with single tires 36x7 in. and the rear wheels with dual tires 38x5 in.

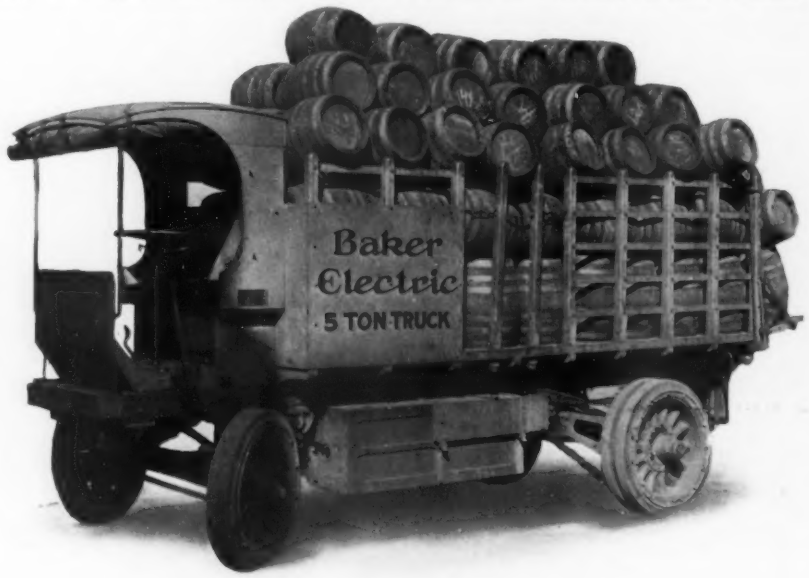
The rear axle is a one-piece drop forging, rectangular in section with a spindle diameter of 3¼ in., while the front axle is a one-piece drop forging of "I" beam section, both front and rear wheels being equipped with roller bearings. The rear wheel and axle construction is particularly heavy, to resist so far as possible, the destructive breakdowns sometimes caused by skidding accidents. Both front and rear springs are semi-elliptic with the ends bronze bushed as are the spring supporting brackets which are riveted to the frame. The frame is constructed from pressed steel strongly braced and gusseted; the side members being 7 in. deep, 3 in. wide and rolled from ¼ in. stock.

Either lead or Edison batteries are furnished, as may best suit the purchasers' requirements; either type is mounted in six separate trays readily removable from the underslung battery compartment, should the necessity ever arise. Adequate means is provided for charging and caring for these batteries, without removing from the chassis. Several different makes and types of lead batteries are listed. The approximate ampere hour capacity of the forty-two cell lead batteries usually supplied is 300. The approximate current draft with the truck fully loaded, is 6½ ampere hours per mile, which permits a safe total mileage per charge of some 40 miles at a speed of 7 m.p.h.

The horizontal drum type of controller, permitting five speeds forward and three reverse, is carried in a cast aluminum casing mounted on the frame directly under a removable foot board in the body. Adjacent to the controller is mounted an aluminum case for protection of the fuses used in the secondary circuits, resistance box and signaling device. All of these parts are protected against dirt and are placed so they are readily accessible. A safety lock is provided so it is impossible to go from forward to reverse speeds accidentally, when suddenly cutting off the power. A running switch inserted in the socket mounted in the heel board, closes the circuit for running purposes and this switch is so constructed that it cannot be removed when the circuit is closed. As a result, the driver, when away from his car, has only to see that he has his key, to know that the car could not be started up by means of the controller, while he was away.

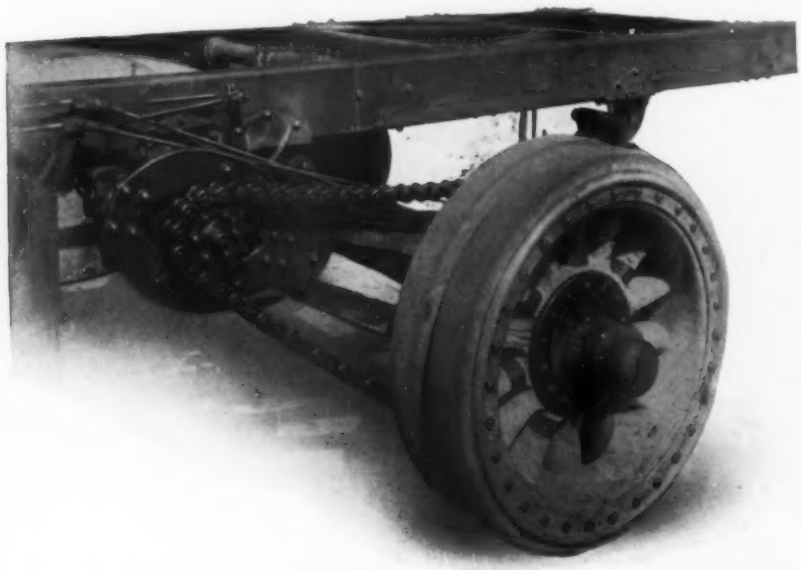
The single large G. E. motor is completely enclosed, its armature being mounted on annular ball bearings. The motor is supported through bronze hangers to the transverse steel tubing member carried on the frame, the bronze hanger preventing any rusting or sticking of the joints when the motor is slightly oscillated to allow for chain adjustment. The heavy Reynold silent chain, driving from the motor to the countershaft, is enclosed in a cast aluminum, gasketed case and operates in an oil bath.

The complete chassis with standard lead battery equipment is listed at $3850. Bodies are supplied to meet all requirements, the cost depending upon the constructions.



Baker Five-Ton Truck

Designed for use of brewers, millers, contractors, etc. Furnished with lead or Edison batteries. Chassis price, $3850, with lead batteries. Three lengths of chassis frame, maximum giving 15 ft. loading space behind driver's seat.



Rear of Five-Ton Baker

Showing the ample parts. Also illustrating the distance rod and chain-adjusting mechanism

BOOTH D177A
NEW YORK SHOW

Last year we showed Worms and Worm Wheels that had run fifty thousand miles in trucks.

That was a lesson in the life of Worm Gears. It was the most interesting exhibit of the Show.

This year we invite you to inspect our new Cleveland Tooth, of which we are the designers.

This is an example of strength unknown to other makers.

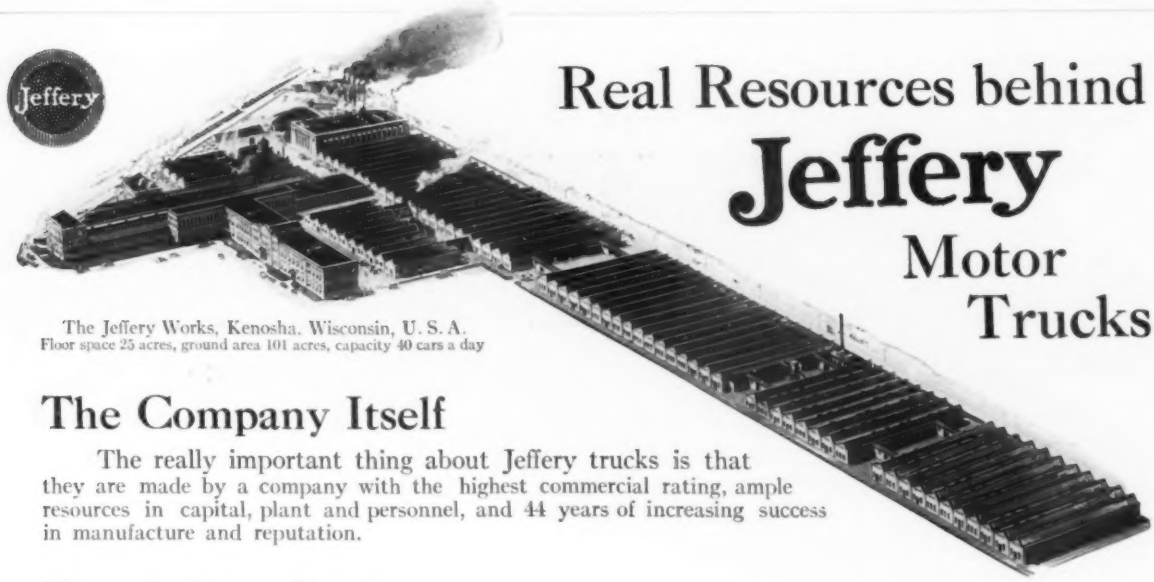
This year we also invite you to inspect an exhibit of efficiency which we challenge any other maker to duplicate.

It is the last word in the making of Worms and Worm Gears, which we exclusively control.

It will be one of the most interesting exhibits in the 1915 Show.

The Cleveland Worm & Gear Co.

Cleveland, Ohio



The Jeffery Works, Kenosha, Wisconsin, U. S. A.
Floor space 25 acres, ground area 101 acres, capacity 40 cars a day

Real Resources behind Jeffery Motor Trucks

The Company Itself

The really important thing about Jeffery trucks is that they are made by a company with the highest commercial rating, ample resources in capital, plant and personnel, and 44 years of increasing success in manufacture and reputation.

The Jeffery Product

It is hardly necessary to add that Jeffery trucks are manufactured, not merely assembled. Harmony in design is easy to obtain when motors, transmissions, axles, etc., are designed and made by the same company, instead of being picked up indiscriminately from individual parts makers.

Important to Importers

These things are important when one is importing trucks from a country hundreds or thousands of miles away. They are a considerable factor, too, in determining the continued success of the enterprise itself and the distributing units all over the world.

Three Truck Models—One for Every Purpose

1500 Pounds

BEVEL gear, shaft drive. High-efficiency bloc-type motor, 3¼ by 5¼ inches. Pneumatic tires. Three speeds forward, one reverse. Speeds to 25 m. p. h. Boxed for export (chassis only), crate measures 15 ft. by 6 ft. 2 in. by 3 ft. 2 in. Weight about 4000 pounds. Volume (for figuring steamship rates), about 303 cubic feet. Prices (chassis and regular equipment, no body)—F. O. B. Kenosha, Wis., U. S. A., $1300. Free on board ship, boxed, (when shipped from Kenosha in carload lots, two trucks to a car) at New York, $1380; at San Francisco, $1490; at New Orleans, $1390.

3000 Pounds

DEAD axles, double side-chain drive. High-efficiency bloc-type motor, 3¾ by 5¼ inches. Solid tires. Three speeds forward, one reverse. Speed governed to 15 m. p. h. maximum. Boxed for export (chassis only), crate measures 16 ft. 10 in. by 6 ft. 7 in. by 3 ft. 9 in. Weight about 5280 pounds. Volume (for figuring steamship rates), about 416 cubic feet. Prices (chassis and regular equipment, no body)—F. O. B. Kenosha, Wis., U. S. A., $1650. Free on board ship, boxed (when shipped from Kenosha in carload lots, two trucks to a car), at New York, $1735; at San Francisco, $1845; at New Orleans, $1745.

The Jeffery Quad

DRIVES, **brakes and steers on all four wheels.** Carries 4000 pounds in own body and can pull from 2 to 5 tons extra in one or two trailers. (Special six-wheeled semi-trailer outfit, two-way side-dump body, carries 4½ cubic yards or 10,000 to 14,000 pounds.) Four speeds forward, one reverse. Normal road speed governed from 14 to 17 m. p. h. Export box measures 16 ft. 6 in. by 6 ft. 4 in. by 5 ft. 1 in. and weighs about 6800 pounds gross. Volume 531 cubic feet. Prices (chassis)—F. O. B. Kenosha, Wis., U. S. A., $2750. Free on board ship, boxed, carload lots, at New York, $2845; at San Francisco, $2970; at New Orleans, $2865.

The first Jeffery Quad was designed to conform to the specifications of the United States Government which wanted a motor truck that would "go anywhere a four-mule team would go." The U. S. Government now owns a fleet of Jeffery Quads, bought on successive re-orders.

THE Thomas B. Jeffery Company maintains a special corps of transportation engineers who are capable of advising with intending purchasers about any transportation problem. They are conversant with road haulage practice all over the world. Their experience, which dates from 1898, is at the disposal of Jeffery truck users.

Write, wire or cable for special terms to importers.
Photographs, catalogs, etc., sent on request

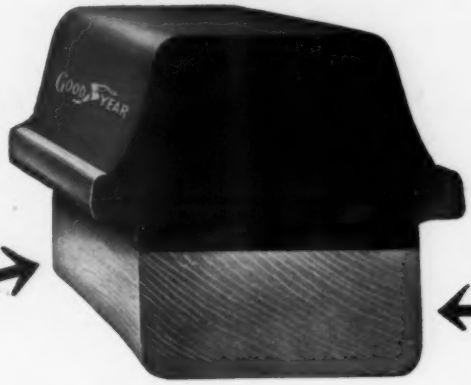
The Thomas B. Jeffery Company

Main Office and Works, Kenosha, Wisconsin, U. S. A.

Cable Address-Jeffcar, Kenosha

No Wedges

No Bands



No Bolts

No Flanges

Truck Tire Problems

Solved After Eight Years of Costly Attempts

Tires constitute the greatest problem of truck efficiency. That problem has now been solved by Goodyear. And in the doing of it a new standard has been set in truck service.

For the last eight years, Goodyear experts have been concentrating on heavy service truck tires. In that time they have built 29 distinct types. For one type alone—the 1915 Goodyear S-V—no fewer than 74 separate tire structures have been built in the aim for perfection. Each new structure has been exhaustively tested under most rigid working conditions. Some 2100 tires have been so tested and watched. Development has kept step with actual known requirements.

The result of this eight-year continuous progress is our 1915 Goodyear S-V Truck Tire. This tire marks today's finality in truck tire efficiency.

See These Advantages

Applied in five to ten minutes. No rights or lefts. No wedges, flanges, bolts or bands. 1915 Goodyear S-V Truck Tires are pressed on the wheel. Go on to stay. No trouble through tires working loose, because the pressure at which they are applied—a minimum of twenty-five tons—exceeds any stress or strain the tire can ever receive in actual use.

Flat treads. Better load distribution, traction and wearing quality. Absence of special fastenings means a lighter and a trouble-proof tire.

GOODYEAR
AKRON, OHIO
S-V Truck Tires

A Rubber-and-Steel Welding

The steel base is a corrugated channel, to which is vulcanized a layer of hard rubber. By a Goodyear process the steel, the hard rubber and the soft rubber tread are welded into one inseparable unit.

Remember all that has been done in the attainment of such tire perfection, efficiency and economy. The work done by the men in the Goodyear Experimental Department in the development of Goodyear Tires costs us $100,000 a year. It is the price we pay for your insurance of tire value.

Reduce Tire-Mile Cost

It will pay to ask us to tell you of concerns using 1915 Goodyear S-V Truck Tires, and how they have reduced cost per tire-mile.

It will interest you to learn how these concerns are saving equipment—the load—the driver's time—how they are keeping trucks in commission day-in-and-day-out by using Goodyear S-V Truck Tires—today's last word in tire efficiency.

Writing and asking questions involves no expense or obligation on your part. Write today.

THE GOODYEAR TIRE & RUBBER COMPANY, Desk 94 Akron, O.

Makers of Goodyear No-Rim-Cut Automobile Tires

(2097)

Independent Light Delivery Trucks

Always on the Job

No Matter What the Job

Worm Drive

WORM DRIVE--The Ultimate Choice

The **Worm Drive** is the ultimate choice of wise buyers of motor trucks. Its life is practically without limit, giving service of 50,000 to 100,000 miles with no diminution in efficiency. It is absolutely silent, its parts are few and strong, it is completely enclosed and protected from dirt, it is easy to assemble, and it is the most efficient and dependable drive known for a truck of this class.

Tried and Proven Construction

Two years were spent in investigating the requirements of the light delivery field and perfecting the **Independent** Truck. It is designed by competent engineers, men who have specialized for years on delivery problems. Its construction has been thoroughly tested, and proven satisfactory in every detail. It sets a new standard for light delivery trucks, and it is unquestionably the leader in its class.

A WORM-DRIVE Truck for $1285 — and what is more, an **Independent!** This is the winning combination. Worm drive alone doesn't make a light delivery truck successful. Price alone doesn't make it attractive. But put the worm drive in a tried and tested construction which has been perfected and proven in every detail to be the most satisfactory possible, and sell this truck for $1285—then you have the most remarkable value in motor trucks, a value you can get only in the **Independent.**

An Exceptional Opportunity The light delivery field is a large and growing one. The market is practically unlimited. Light delivery trucks are used successfully by express and parcel deliveries, hardware and furniture dealers, milk depots, department stores, grocers, manufacturers, farmers, and practically every industry which delivers goods.

The **Independent** has no equal in strength and efficiency, and is practically without competition in its class. Dealers who handle it will find ready sales and exceptional profits. Our dealer's proposition is an attractive one. Send for full particulars and specifications.

PRICE, CHASSIS ONLY, $1285

We also build the Cass Model "E," 1½-Ton Truck, selling for $1850. Write for complete specifications

Independent Motors Company

Incorporated

Port Huron **Michigan**

The TRANSIMETER

Makes Truck Operation Cost Less

Fleet of 19 Packard Trucks Equipped With Our Recording Instruments

You Can Save Money by Keeping Mileage Records

When you know exactly how far your truck travels you can make sure of getting the guaranteed wear from your tires—the full value from your gasoline—and the right mileage from your storage batteries if your truck is electric.

You know how far your tires, fuel and oil *should* go. Are you taking measures to find out how far they *actually do* go?

The TRANSIMETER Hub Odometer tells you exact mileage. It is always easy to read because the figures remain upright (exclusive TRANSIMETER feature) and the glass window ***does not*** become obscured by grease.

½-¼ Size

"Dreadnought" Type
TRANSIMETER

Guaranteed indestructible. This is the only hub odometer so guaranteed.

In actual collisions the housing has been torn completely from the hub without injury to the mechanism. There are no frail parts.

Also guaranteed grease- and dust-proof—the figures are always legible.

The figures do not revolve and are always right side up and easily read.

The action is positive—steel pin connection between axle and mechanism.

The diagram opposite shows details that make the Transimeter superior to other hub odometers.

Price—$20

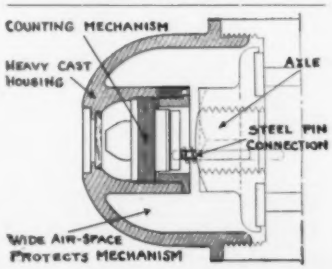
½ Size

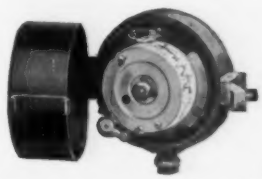
"Applied" Type
TRANSIMETER

Can be fitted directly to the hub cap of any car or truck.

It has all the superior qualities of the "Dreadnought" type except the air space in the housing. Recommended for use on lighter vehicles and touring cars.

Price—$16.50





⅛ Size

A Tape-Recording Instrument
RECORDOGRAF

Gives a permanent tape record of the entire operation of your truck.

1. Time truck is moving.
2. Time truck is still.
3. Distance covered.
4. Speed at various times.

It shows where the delays are and how long.

It registers every stop.

With the Recordograf you can compile data of every description, such as cost of deliveries, efficiency of truck and driver, etc., which will enable you to stop the leaks, get better efficiency, and materially cut down the cost of your truck operation.

See These Cost-Reducing Instruments at Both Shows

New York—Booth D-32 **Chicago—Booths 193 and 194**

Mfrs. of the Jones and Popp Taximeters **AMERICAN TAXIMETER CO.** **Seventh Ave. at 49th St. NEW YORK CITY**

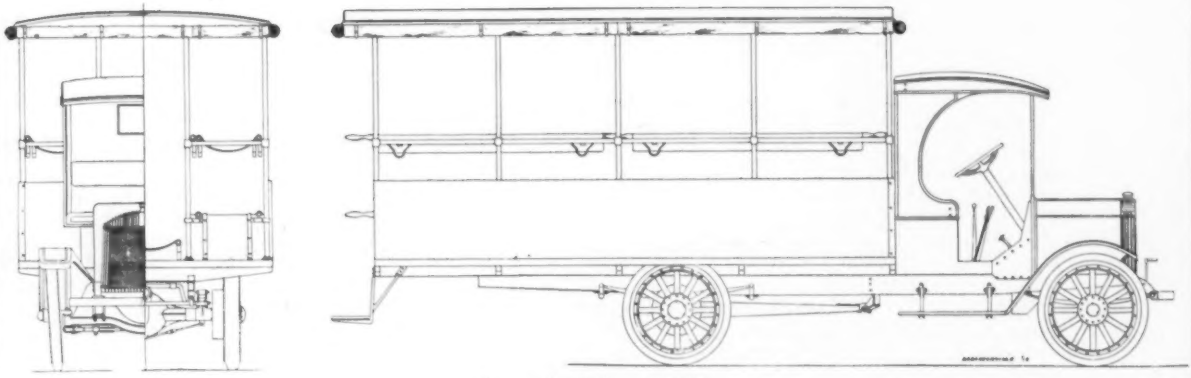
Service Stations in the Following Cities:

San Francisco New Orleans Washington Chicago Detroit Philadelphia Seattle St. Louis Boston

Highland Standard Bodies

FOR

ARMY SERVICE

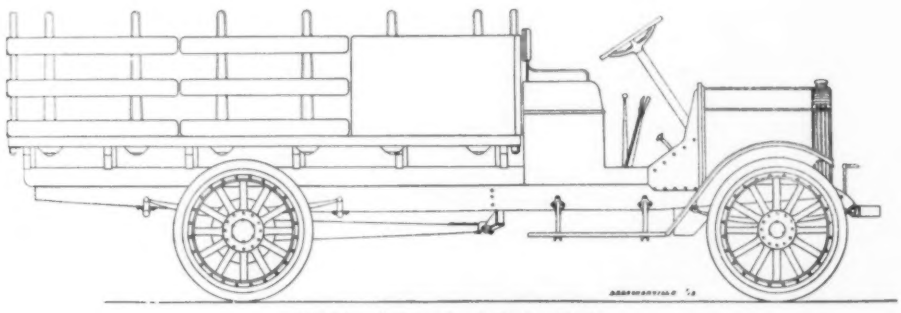


Army Ambulance Body

Ambulance Bodies for Four to Fifteen Stretchers

Army Service Bodies with box or tarpaulin tops

Being specialists on standardized bodies for Motor Trucks, we always carry in stock a large quantity of finished material, so are prepared to make prompt delivery on any quantity of bodies.



Highland Standard Stake Body

For quotations and delivery, write—

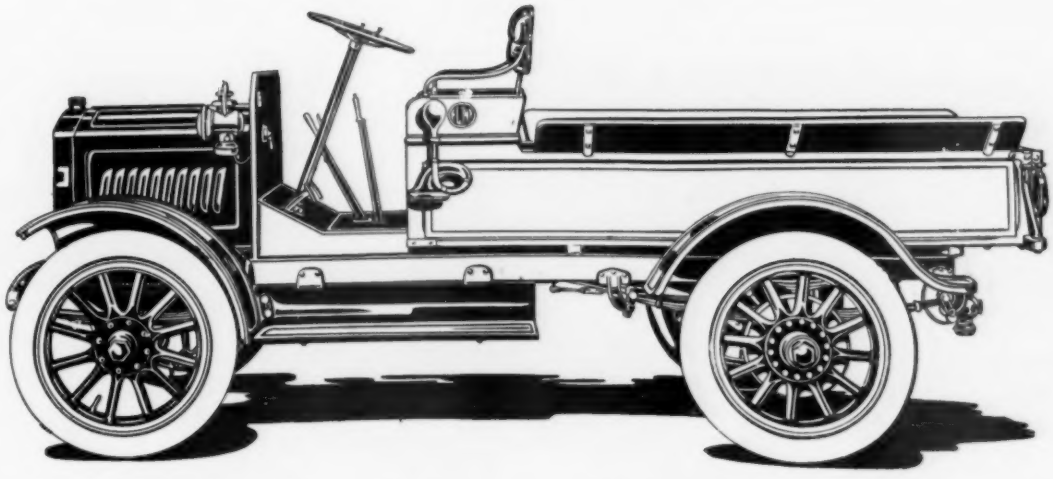
The Highland Body Manufacturing Co.

Cincinnati, Ohio

ANNOUNCEMENT

1915 Flint Model

2000 Pounds Capacity



Chassis Price, { $1190 WITH SOLID TIRES / $1275 PNEUMATIC TIRES

The 1915 Model closely follows the constructional lines which have made the "FLINT" such a phenomenal success in the past, with some minor changes and refinements.

This new model spells "Opportunity" for the dealer who is anxious to get the 2000 lb. business in his locality. It is the lowest priced 2000 lb. truck of its quality on the market, and the greatest value of any of that capacity.

It is a truck of established reputation. Its correct solution of the problems of arranging loading space and its efficiency-producing features of construction, have caused it to earn its way in the service of those who are close figurers of costs.

The producing company is long established, with a reputation for quality to maintain, and production facilities of the highest class. It is financially strong and has both the ability and disposition to back up "FLINT" dealers in every possible way. Your customers are assured of having a truck of proved worth, backed up by a company of unquestioned integrity and stability.

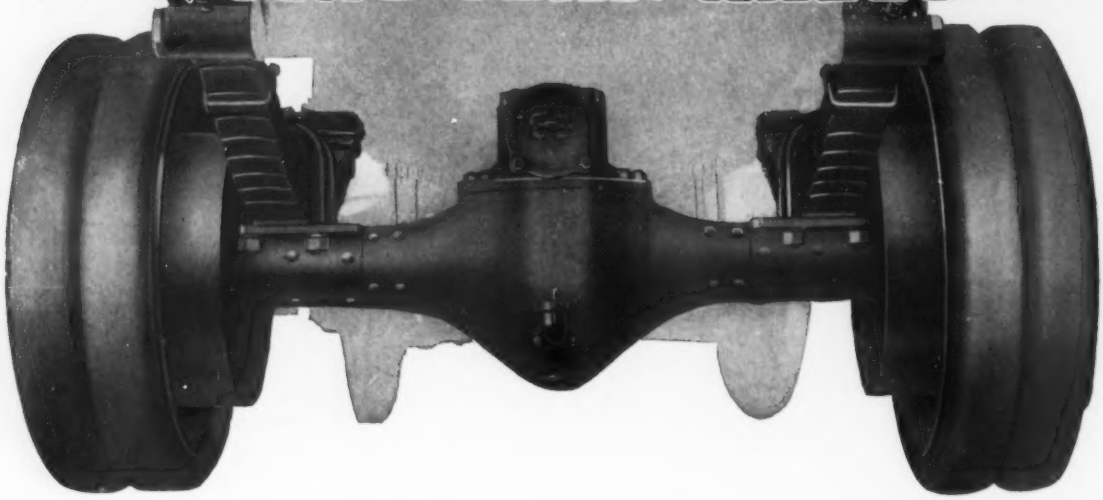
All of these elements are essential to a successful agency. Nowhere else can you secure a truck that offers so much real worth and value for the money as you get with the "FLINT." It is to your interest to secure definite data about the "FLINT" proposition. We'll place all this in your hands upon your request. Write today!

Flint Commercial Car Department

DURANT-DORT CARRIAGE CO. FLINT, MICHIGAN

SHELDON

WORM GEAR AXLES



The clean cut appearance and the impression of balance which Sheldon Worm Gear Axles present indicate to the keener mind a masterpiece of design and construction.

A technical examination of the working components of this type of Sheldon Final Drive invariably substantiates the confidence the assembled unit inspires.

A further analysis of the elements of Sheldon design and construction rounds out your investigations and puts the most skeptical in a receptive frame of mind to learn that—

By tests — exhaustive and all-comprehensive — under every conceivable condition of road, load and grade — Sheldon Worm Gear Axles deliver from 94 to 97 per cent of power effort to the rear wheels.

94 per cent of power effort delivered to the driving wheels is a remarkably high degree of efficiency even for a Worm Gear Rear Axle. Yet the final drive on the Experimental Truck, which Sheldon Engineers use for tests and experimental purposes shows that efficiency day in and day out, with loads of all kinds, and on roads and grades, every kind of which abound in the hills and mountains in and around Wilkes-Barre, Pa.

With the splendid efficiency of Sheldon Worm Gear Axles in mind, note the way in which the brake drums protect the brakes — double internal on each wheel.

Another feature of Sheldon Final Drive is the arrangement which provides ample clearance for the use of skid chains when traction is poor.

The Sheldon policy of placing the various manufacturing departments under the direct supervision of Sheldon Engineers has worked such marked advance in the development and service of Sheldon Springs that the spring department has become one of the most important units of the Sheldon organization.

In changing the corporate name of this concern to the Sheldon Axle and Spring Company, we believe we are giving it a more practical name — at the same time doing justice to our spring department and to those manufacturers who now equip their cars or trucks with Sheldon Springs.

The Sheldon Axle and Spring Company specializes in the design, development and manufacture of —

Worm Gear Rear Axles, Front Axles and Springs for both pleasure cars and all types of commercial vehicles — and

Brake and Radius Rod Equipment for chain drive trucks.

NOTICE THE NEW CORPORATE NAME

THE SHELDON AXLE AND SPRING COMPANY

MAKERS OF SPRINGS AND AXLES FOR HEAVY DUTY SERVICE FOR MORE THAN 50 YEARS

WILKES-BARRE .. .. PENNSYLVANIA

Chicago: 122 S. Michigan Blvd. **San Francisco: 444 Market St.** **Detroit: 1215 Woodward Ave.**

SCHWARZ WHEELS

The Standard Wheels for American Cars and Trucks

This is the position that has been earned and maintained for many years by SCHWARZ WHEELS. They have become the dominant wheels because of their quality, strength, durability and ultimate economy. They have become the choice of the leading designers, engineers and makers of the Industry, because they have conclusively shown in every conceivable kind of tests that the SCHWARZ method of construction is superior to all others.

If there is any doubt in your mind as to this leadership, just note, when you go to the various Shows, how many of the worth-while cars and trucks have SCHWARZ WHEELS. Note how they are present on quality cars, and how their presence is considered a selling asset for these cars.

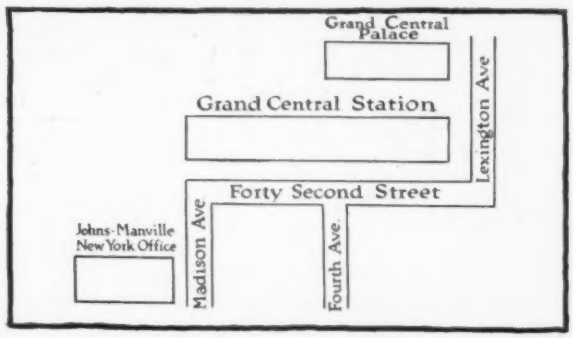
Go with an open mind, and the more you hear of SCHWARZ WHEELS the more you will be convinced they are the wheels for your trucks. Meanwhile, send for "Bear the Burden"—it will give you a good idea of why SCHWARZ WHEELS are best.

The Schwarz Wheel Co.

Frankford Philadelphia Pennsylvania

Johns-Manville Accessory Show

January 2nd to 9th Inclusive, Madison Ave. & 41st St. New York



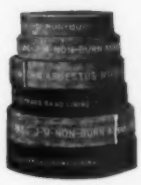
Every Accessory Exhibited Here Holds a Personal Interest for every man who makes, buys, sells or owns Commercial Cars

DURING the week of New York's Automobile Show we shall devote a large area of floor space in our New York building to an exhibition of J-M Automobile and Commercial Car Accessories.

In whatever capacity you are interested in accessories, you are sure to find this exhibition decidedly worth while.

Note the convenience of our location to the Grand Central Palace as shown by the map above.

Some of the Accessories on Exhibition

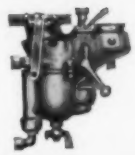


Jones Hub Odometer

The simplest and most accurate of all mileage recording instruments. Replaces the regular hub cap and renders an indisputable record of mileage. Registers backward as well as forward wheel travel. Permanently sealed when attached, absolutely tamper-proof.

J-M Non-Burn Brake Lining

The thoroughly dependable brake lining that contributes to greater safety in truck driving and insures economy as well, by making frequent replacement unnecessary. Made from only the best long-fibre Canadian Asbestos, not a particle of perishable material in it. Fully guaranteed.



Long Horn

Essentially the correct signal for trucks and commercial cars. Warning note is powerful, full-toned and far-carrying, — an unmistakable signal that can not be ignored. Sturdily built to stand up for years in truck service, the signal you assuredly need if you put safety first.

Carter Carburetor

A bona fide fuel saver that reduces fuel consumption at least 10% and gives additional power and flexibility. Sold subject to your approval. Under our guarantee you can return any Carter Carburetor that does not "make good with a vengeance."

Jones Speedometers and Recorders
J-M (Mezger) Soot-Proof Spark Plugs
J-M Dry Batteries — **J-M Automobile Tape**
J-M Automobile Clocks — **J-M Tirenew**
J-M Narco Products — **J-M Fire Extinguisher**
G-P Muffler Cut-Out — **"Noark" Enclosed Fuses**
J-M Lens, Non-Blinding
Johns-Manville Shock Absorbers

2934

H.W. JOHNS-MANVILLE CO.

Madison Ave. & 41st Street New York

This is the largest of our eight electric models. Capacity, 6 tons. Chassis price without battery,

$2500

This is the smallest of our eight gasoline models. Capacity, 1500 lbs. Chassis price,

$1090

YOUR haulage or delivery problem has features all its own. You are anxious to solve this problem of yours in the most satisfactory way. While the final decision rests with you, aren't you anxious to take what advantage you can of the information and experience of the largest company in the world building both gasoline and electric trucks? If you are, write us at once.

In some businesses electric trucks have decided advantages. In others gasoline trucks only can give the required service. In still others, either gasoline or electric trucks can be used with profit. But there is a certain size truck, electric or gasoline, that is the **most profitable truck for you.**

GMC
GENERAL MOTORS COMPANY
TRUCKS

Gasoline *Electric*

GMC prices are low because of big production and low overhead expense per truck. Big buying power and vast equipment make it possible for us to build the best trucks we have ever built and sell them at prices that are lower than other high-grade trucks.

General Motors Truck Company builds both gasoline and electric trucks in the most complete range of sizes yet produced. We have no prejudice in favor of any particular truck. Our one endeavor is to help you choose the truck that will serve you best. We can profit only by recommending the most profitable truck for you.

Our service plan actually co-operates with you to secure the results you desire in delivery or haulage service. A letter from you outlining the nature of the work you have to do and the character of the roads in your locality, will assist us in giving you information of value. It would be wise to communicate with the nearest G M C dealer also.

Dealers: For the same reason that G M C Trucks are most profitable for business men to buy, they are also the most profitable for the dealer to sell—Let us tell you why.

Direct Factory Branches:
Philadelphia St. Louis
Kansas City

GENERAL MOTORS TRUCK COMPANY
One of the Units of General Motors Company
PONTIAC MICHIGAN

Direct Factory Branches:
New York Detroit Boston
Chicago

BESCO

STEEL WHEELS
for
MOTOR TRUCKS

Cast Steel, Disc Type, Motor Truck Wheel

Designed for Standard S. A. E. Demountable Tires

See Our Exhibit at Chicago Show

Electric Furnace Vanadium Steel Uniformly Heat-Treated

Ten Reasons Why They Should be on Your Trucks

1. **Completeness**—Come ready for tires and bearings. Less labor and trouble to put on.
2. **Adaptability**—Made to your specifications. Adaptable to chain, worm, internal-gear or four-wheel drive and tractor equipment.
3. **Strength**—Stronger than the spindles on which they are mounted, and less likely to break in accidents.
4. **No Excessive Strain**—being distributed uniformly around periphery of wheel, which has resiliency to absorb the dead shock.
5. **Absolutely True**—Turned at all points on fixed centers. Don't get out of true or wobbly, like wooden wheel, or cause such wear on tires.
6. **Faster**—Being lighter at the rim permits more rapid acceleration of speed.
7. **Unaffected by Climate**—Do not change in any respects; no spokes to squeak or rattle.
8. **Appearance**—Neat, clean, more easily painted, more substantial looking. Do not pick up mud, snow or ice.
9. **Weight**—In most cases much lighter than wood.
10. **Cost**—Practically the same as wood, when **complete** wheels are considered, despite the greater strength, durability and efficiency of "Besco" Steel Wheels.

Send for our Catalog and complete data

Buchanan Electric Steel Company, Buchanan, Mich.

The Edison-Equipped Electric Truck

is the Ultimate Solution of the most important problem now confronting the Warehouse and Storage Business—*i. e.* Transportation.

Why Edison Storage Batteries?

Because Edison Nickel-Iron-Alkaline Storage Batteries have the following advantages in this kind of service:

1.—They may be "boosted" at very high rates and charged sufficiently in a short time to meet emergency conditions.

2.—They are everlastingly on the job and require no expert attention in the garage or on the road.

3.—They may be left idle or worked for months on very small daily mileage without injury or extra care.

4.—They are guaranteed to be capable of developing ***100 per cent*** of rated capacity during ***four full years,*** thereby eliminating all risk on the purchaser's part that the profits of the road will be spent on repairs or renewals.

Economy *plus* Reliability *plus* Permanence

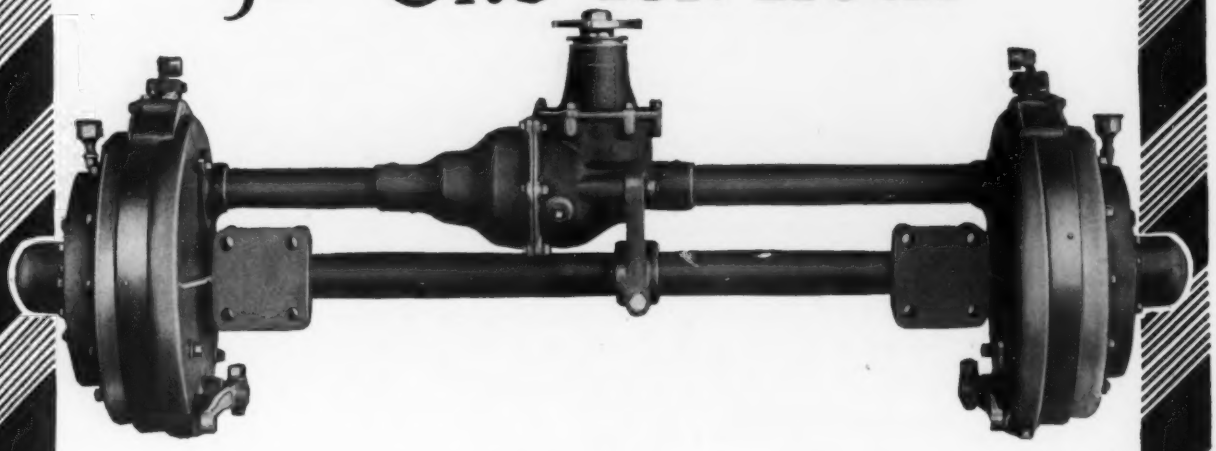
The Warehouse business is a fertile field for the Central Station and Electric Truck Manufacturer. We have a Co-operative Campaign we would like to discuss with you.

Edison Storage Battery Company

141 Lakeside Avenue - - - Orange, N. J.

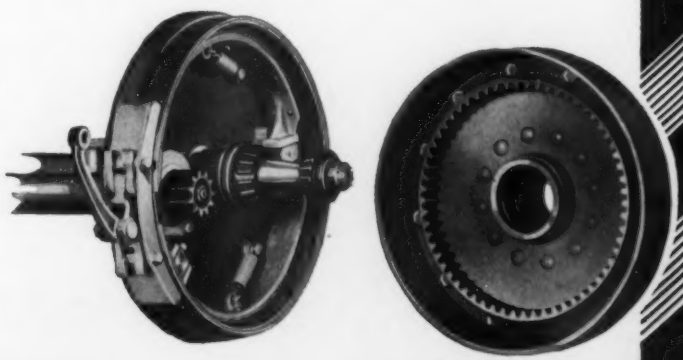
Russel

Internal Gear Drive Axle for One Ton Truck

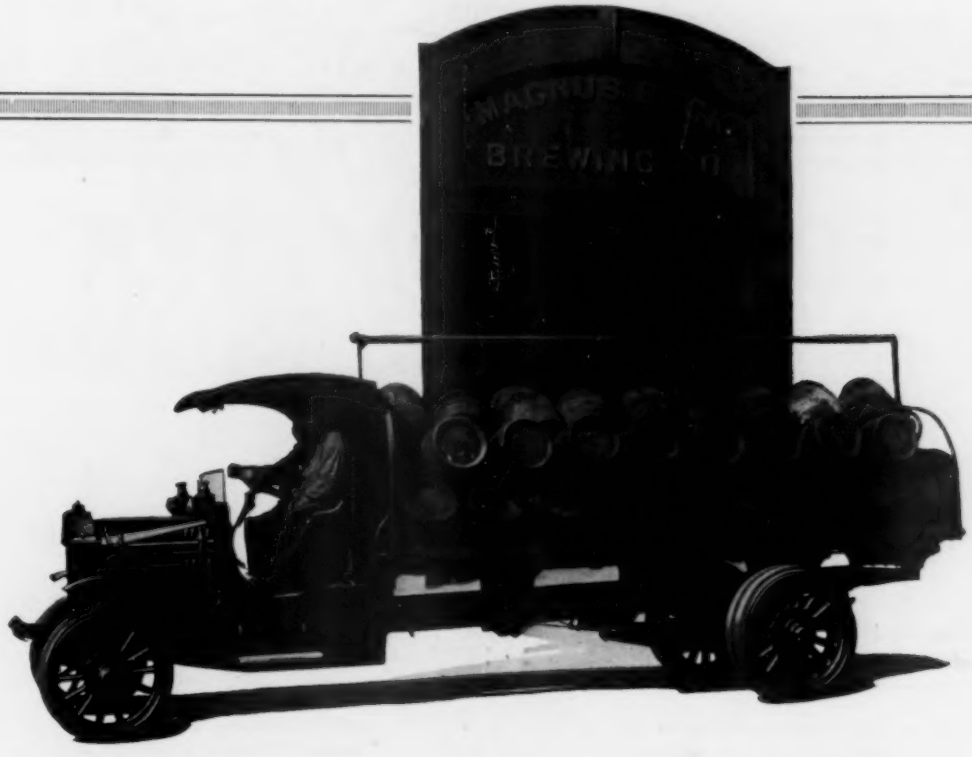


FOR over a year our Engineering Department has concentrated its entire attention on the development of the one ton truck axle. Our investigations and tests have shown us the strength and weakness of the various rear drive systems now in use. The logical result has been the development of the one ton axle announced herein. We believe it represents the most serviceable compromise between the conflicting demands of durability, efficiency, quietness, simplicity, neatness and cost.

RUSSEL MOTOR AXLE COMPANY
North Detroit
• Michigan •



When Writing, Please Say—"Saw Your Ad. in the C C J"



This Pierce-Arrow Motor Truck Does the Work of Four Teams

Operating in the service of the Magnus Beck Brewing Company of Buffalo, N. Y., this truck carries a load of 50 half barrels and has replaced four teams. The truck has also made it possible to double up routes, giving more frequent deliveries to customers.

The roll body adapted to the Pierce-Arrow motor truck is especially advantageous in route work of this kind.

Kegs are easily removed and empties replaced without rearrangement of the load and the time thus saved results in greater economy and efficiency of operation.

We shall be glad to investigate your delivery problem and recommend the type of truck best adapted to your particular service.

The Worm-Gear

All Pierce-Arrow Trucks are equipped with the worm-gear drive, which is a positive guarantee of effective service under the most difficult conditions.

THE PIERCE-ARROW MOTOR CAR COMPANY
BUFFALO, NEW YORK

Veeder
HUB ODOMETER

Whether you operate one truck or a hundred you need the **VEEDER HUB ODOMETER,** for without it you cannot be certain of having accurate knowledge of mileage. Without that knowledge you cannot hope to have accurate cost sheets or to obtain the most economical service from your trucks.

The Form K Veeder, selling for $20, has become a necessity to those truck owners who are determined to make their trucks give the greatest possible service at the least operating expense. It is a thoroughly accurate and dependable instrument, which records forward whether the truck runs forward or backward. It cannot be made to record anything but the truth and a shirking driver cannot cover up his derelictions. It gives you the basis for correct cost sheets and a profitable delivery system. Write for our booklet telling about the **VEEDER HUB ODOMETER.**

THE VEEDER MANUFACTURING COMPANY

10 Sargeant St., Hartford, Conn.

Makers of Cyclometers, Odometers, Tachometers,

T. H. CRANSTON & CO.
56 E. Randolph St. ,Chicago

Tachodometers, Counters and Small Die Castings

BERNARD I. BILL
543 Golden Gate Ave., San Francisco, Cal.

WHY
EXPERIMENT
WITH
EXPERIMENTERS?

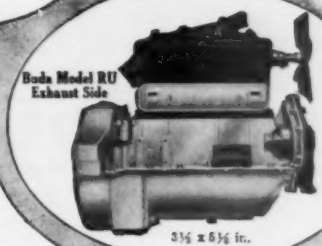
Cleveland
Worm Gears

ARE BEST
BY TEST

Cleveland
Worm & Gear Co.
Cleveland, Ohio

Don't guess—find out!

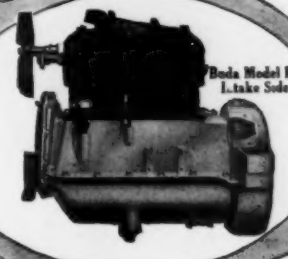
Suppose we assure you—as we *do*—that in accessibility and convenience, power and economy, design and durability, the Buda motor is unexcelled for your purpose at any price. That means your next order for us surely—*unless you have a doubt.*



BUDA MOTOR

"The part that sells the truck"

Now, in the above assurance, we *mean* what we say, exactly at face value. If you THINK some other motor is better than a Buda or a better *buy* than a Buda, you owe it to yourself to make us prove up. *Don't guess—find out!*



THE BUDA COMPANY
(Factory, Harvey, Ill., Chicago Suburb)
Address all correspondence to our factory representatives:
BRANDENBURG & COMPANY
1108 S. Michigan Ave., Chicago 57th & Broadway, New York 1111 Dime Bank Bldg., Detroit

The SPEEDOGRAPH Tells

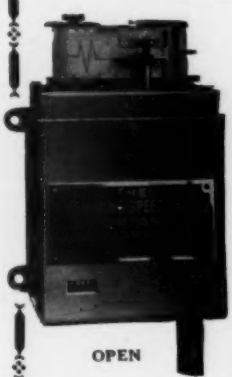
Just What Your Truck Was Doing Every Minute Every Day

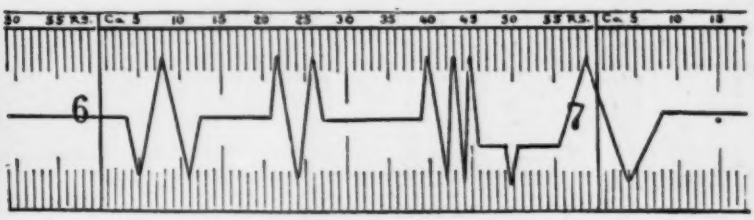
Time, Distance and Speed of Every Run
Every Stop and Its Time and Duration
Rate of Speed at any Given Time
Mileage Per Trip, Day or Year

You must have such information to prevent waste and abuse, and to obtain efficient, economic service.

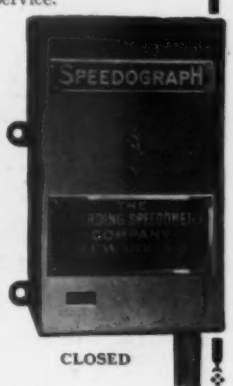
THE SPEEDOGRAPH SAVES

Time — Tires — Gasolene — Repairs — Money





Facsimile of Record
Accurate, Clear and Legible



The tape is divided into hours and minutes, and the record line shows every movement of the vehicle.

Write for catalogue and prices

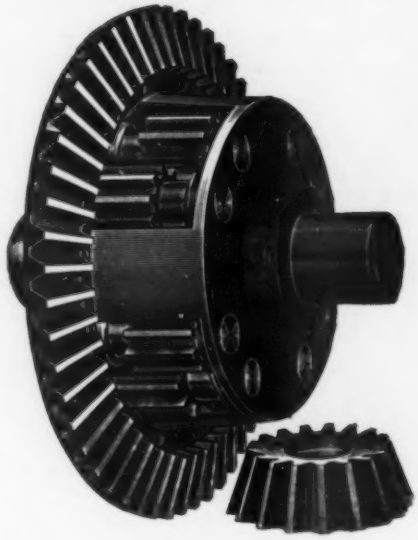
The Speedograph Sales Corporation ***General Distributors*** **No. 11 Broadway, New York**

When Writing, Please Say—"Saw Your Ad. in the C C J"

CULLMAN SPROCKETS and Differentials

in stock and to order.

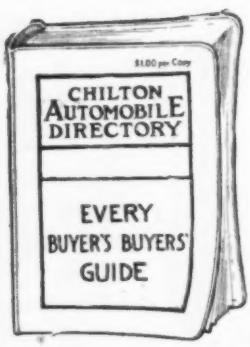
Send for catalog and let us quote you on your requirements.



CULLMAN WHEEL COMPANY, CHICAGO
1351 GREENWOOD TERRACE

THE BUYER'S TIME SAVER

that's what the busy purchasing agents call the



CHILTON AUTOMOBILE DIRECTORY

It tells them what they want to know about sources of supply for parts, tools, appliances and accessories and gives them the information when and as they want it. Every busy buyer should keep a copy at his right hand; for it will save him time and money. Most buyers do—if you are one of the few exceptions, place your order now for a copy of the

January Issue Will be Ready for Distribution **January 15th**

After one experience with it you would not be without a copy at any price. Rarely, if ever, has so much valuable information been bound up in one volume, as you find here.

Bound in a flexible Fabrikoid leather---price $1

Send now, before you forget it, your check, money order, or currency to the

CHILTON COMPANY, Market & 49th Sts., Philadelphia

Gould Storage Battery

A recent Cleveland customer wrote to our local branch manager:

"I consider the Gould Battery by far the best both as to mileage and durability.

"One of the big advantages in purchasing a Gould Battery is the splendid attention given by your service station. I always found you solicitous as to frequent inspections.

"Prior to purchasing the 32-cell Gould Battery for my car last October I owned three others. To my knowledge, representatives of those batteries at no time made inquiry as to their welfare.

"The attention you give patrons is especially valuable, inasmuch as the average electric vehicle owner knows little about care of batteries."

Our unvarying instructions to representatives are to help all Gould Battery users with good attention, and good advice on how to keep their batteries free of faults. We wish to make strong satisfaction stronger—we stay close to customers so they will stay close to us.

We can and will give every assurance of splendid service, high mileage per charge and long battery life.

Gould Renewals fit jars of any make.

Ask for booklet, "What Gould Vehicle Batteries Are Doing."

Gould Storage Battery Co.

General Offices: 30 East 42nd Street, New York City

Boston, 14-16 Cambria Street — Detroit, 88 East Congress Street
Philadelphia, 613 Betz Bldg. — Chicago, 225 E. 22nd St.
Cleveland, 1761-5 East 18th Street — San Francisco, 1448 Van Ness Ave.
Los Angeles, 110 East Pico Street

WORKS: Depew, New York

Agents in: WASHINGTON, ROCHESTER, BUFFALO, PITTSBURGH, MILWAUKEE, MINNEAPOLIS, ST. LOUIS, KANSAS CITY, OMAHA, DENVER, TOPEKA, SEATTLE

Canadian Representative: R. E. T. PRINGLE
Toronto Montreal Winnipeg Vancouver

Full stock carried in all cities where we have offices or agents

104

What is more important on an Auto Truck than its BRAKES?

You demand for your truck: power, body room, strength and simplicity in construction. You load it up, expecting the engine to walk off with it.

But how about holding it on a hill or stopping it at a railroad crossing?

When it must stop you can depend upon

Thermoid HYDRAULIC COMPRESSED Brake Lining—100%

When you set your brakes lined with Thermoid they take hold noiselessly—they grip—you STOP!

That's because Thermoid is brake lining from top to bottom—just as full of friction or gripping power in the center as on the outside—with 50% more material in it and 60% more labor on it than any ordinary woven lining.

Thermoid won't burn up on a long, steep, downhill run. Oil, gasoline, water, heat, dirt, won't affect it, and it will outwear any other brake lining, bar none.

Our Guarantee:
Thermoid will make good—or WE will.

Specify it on your 1915 truck—order your repair man to put it on your truck in service now.

THERMOID RUBBER COMPANY
TRENTON, NEW JERSEY, U. S. A.

Demountable Tires on Your Trucks Will Save You Money.

You wouldn't have a pleasure car that didn't have demountable rims, because you could not bear to be delayed by tire changes.

United States Motor Truck Tires

DEMOUNTABLE

How much more important to have demountable tires on your motor trucks, for slow tire changes on motor trucks mean more than mere inconvenience—they result in loss of money.

United States Motor Truck Tires are long-mileage tires, and can be quickly changed by your own man on the road.

United States Tire Company
New York City

Power for Every Purpose

Maximum Power, Speed and Endurance with Minimum Cost for upkeep and operation. Extreme Simplicity with Unequaled Efficiency. Perfect Balance. Long Life. You get all these advantages when you equip your commercial cars or pleasure cars with

THE RUTENBER MOTOR

Fours and Sixes suited to the requirements of all kinds of motor-driven vehicles. Standard or Unit Types. All L-Head, Four Cycle. The Rutenber Motor practically guarantees a ready sale for the car or truck that carries it.

We invite manufacturers to investigate our motors and our facilities for giving service. Literature on request.

The Rutenber Motor Company
Marion - - Indiana

B & G Gramm's Trucks

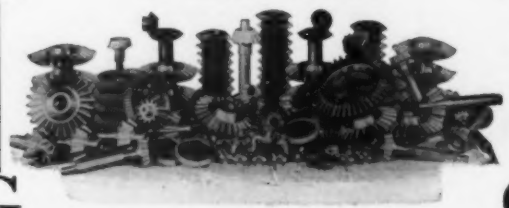
appeal to the man who has had experience in the use of motor trucks.

To him their quality points, the individual clutch transmission, guaranteed springs, self-starter, etc., mean a definite saving in operating costs.

The full line, 1 to 6 tons, with all its features, is described in our complete catalog, which will be sent you on request.

THE GRAMM-BERNSTEIN COMPANY
Dept. 1 LIMA, OHIO, U. S. A.

GEARS



GEARS GEARS

Bevels Mitres Worms
Spurs Spirals Racks
Sprockets

We produce in quantities to specification cut and planed Gears and Pinions of all descriptions. As a source of supply in connection with *Gears* and *Gear Cutting*, we are considered an asset by many of the best interests. They buy from us year after year, because these advantages are afforded:

(1) *Unexcelled facilities.*
(2) *The highest standard of workmanship.*
(3) *Years of experience as specialists in gearing.*
(4) *A most careful selection of materials.*
(5) *Particular attention to deliveries.*

THE VAN DORN & DUTTON CO.
Gear Specialists
CLEVELAND (Sixth City)

GEARS

When Writing, Please Say—"Saw Your Ad. in the C C J"

GEAR BRONZES

CRAMP

BEARING METALS

The best motor cars and trucks, those famed for their sturdiness and long service, boast the **CRAMP METALS.** The world's greatest battleships have spread the fame of **CRAMP METALS** world wide. The high standard of precision, accuracy and quality set in these battleships is not approached in any other engineering feats. Everywhere and every day **CRAMP METALS** become a part of some great commercial enterprise, simply because their quality is known. Why experiment? Specify—

"CRAMP BEARING METALS AND GEAR BRONZES"

The William Cramp & Sons Ship & Engine Building Company, Philadelphia, U. S. A.

The New 1915 1500 lb. Commerce

SHAFT DRIVE
CONTINENTAL MOTOR
CHOICE OF THREE BODIES

$975
COMPLETE

THE COMMERCE MOTOR CAR CO., 753 Penobscot Bldg., Detroit

In New York City

Over 50 per cent of all the Electric Commercial Cars and Trucks in New York City are equipped with "Exide" Batteries.

THE ELECTRIC STORAGE BATTERY CO.

New York Boston Chicago **PHILADELPHIA, PA.** Denver San Francisco Seattle
St. Louis Cleveland Atlanta Detroit 1888-1914 Rochester Los Angeles Portland, Ore. Toronto

FRAMES

THE PARISH & BINGHAM CO.
CLEVELAND, OHIO

Our Entire Engineering Force is at Your Disposal

Stegeman

MANUFACTURING POLICY

Our idea in building trucks is not to build the most—(QUANTITY)—our idea is to get *permanent* satisfied customers and *users*, and there is only one *absolute* way of doing this—

USE THE WORLD'S BEST UNITS—

(Not second best or something nearly as good.) We use Continental motors, Brown-Lipe nickel-steel gears throughout in both transmission and differential, Timken bearings, Eisemann automatic advance magnetos, mangano-silicon springs, chrome-vanadium axle forgings, nickel steel in all bolts and pins plus "STEGEMAN" simplicity and 10 special features of design—each one of which has proved in practice an item of maintenance economy.

Our Users from Coast to Coast are the Country's largest and most prominent buyers.

Write us and have our literature for reference

STEGEMAN MOTOR CAR CO., Milwaukee, Wis.

REG. U. S. PAT. OFFICE

High-Tension Magnetos

for *Fords*—pleasure and commercial—are revolutionizing the running of thousands of these remarkable machines. If you want **real** *Ford* efficiency, write for our free booklet, "Ford Power Possibilities."

SPLITDORF ELECTRICAL COMPANY

ATLANTA	10-12 E. Harris St.	LOS ANGELES	1215 S. Hope St.
BOSTON	1112 Boylston St.	MINNEAPOLIS	34 S. 8th St.
CHICAGO	64-72 E. 14th St.	NEWARK	290 Halsey St.
CINCINNATI	811 Race St.	NEW YORK	18-20 W. 63d St.
DALLAS	402 S. Ervay St.	PHILADELPHIA	210-212 N. 13th St.
DAYTON	427 E. 3d st.	SAN FRANCISCO	1028 Geary St.
DETROIT	972 Woodward Ave.	SEATTLE	1628 Broadway
KANSAS CITY	1827 Grand Ave.	TORONTO	469 Yonge St.
LONDON		BUENOS AIRES	

VIM
LIGHT DELIVERY

The Car that Proved a Real Solution of Delivery Problems

Price, $635—Capacity, 1000 lbs.

A real commercial car—strong, rugged, durable—of oversize parts and high quality, at a price which makes it available for merchants of every character. Scores of dealers are finding it the money maker of their careers—it may be such for you. Write for information.

The Touraine Mfg. Company,

Main Office and Factory: Broad and Huntingdon Sts., Philadelphia, Pa.

Plant where Vim Cars are made

Capacity doubled to meet demand of 60 days

The Lavigne Gear Co.

Pioneer Truck Steering Gear Manufacturers

FOR

Trucks, Pleasure Cars and Tractors

WE FURNISH OUR GEARS WITH DRAG LINKS
WRITE FOR BLUE PRINTS

RACINE, WISCONSIN

BESSEMER TRUCK

Illustration shows Model "C" which is equipped with either pneumatic or solid tires. There is more real sturdiness built into this than in any other one-ton truck on the market.

Three Models

MODEL C	MODEL A	MODEL D
1 Ton Capacity	1½ to 2 Ton Capacity	1½ to 2 Ton Capacity Worm Drive
25 H. P.—$1250	30 H. P.—$1800	30 H. P.—$2300

DEALERS: Write us about the special proposition we have for you. The Bessemer line enables you to handle every truck requirement.

BESSEMER MOTOR TRUCK CO.
GROVE CITY, PA.

Part of Fleet of 11 Stewarts in the Service of the Buffalo News

Stewart Delivery Trucks

A New Policy for Dealers

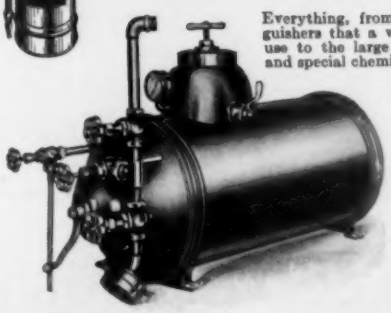
Our dealership proposition is an unusually liberal one. We do not require dealers to put up a lot of deposit money, and contract for a big number of trucks.

With our increased facilities, which mean larger output, we so arrange our schedule as to have a certain number of trucks ahead at all times. Thus, we can assure prompt deliveries.

Write today and find out how it will be to your advantage to handle the 1500-lb. Stewart.

Stewart Motor Corporation, Buffalo, N.Y.
T. R. Lippard, Pres. R. G. Stewart, Vice-Pres. and Chf. Eng.
R. P. Lentz Sec. and Treas.

DEPENDABLE Chemical Fire-Fighting APPARATUS



Everything, from the hand extinguishers that a woman or child can use to the large Chemical Engines and special chemical tanks for Fire Department service.

Into each is put material and workmanship that cannot be excelled. Designs are shown by actual use to be beyond improvement.

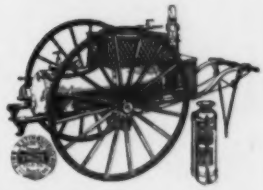
Result: Perfect and immediate action when needed, no deterioration from lack of use or age.

All Our Tanks Are Made of Copper

The name **"CHILDS"** stands for perfection.

Chemical Tanks for Fire Department or other service made to order.

Write for our Complete Catalogue and interesting talk on Fire Apparatus.



O. J. CHILDS CO., Utica, N. Y.
MANUFACTURERS FIRE APPARATUS

W. Fred Richardson, Inc., Storage, of Richmond, Va., first placed a 1½ ton Lippard-Stewart in service March, 1914; then another 2 ton in July, 1914; later a combination hearse for general funeral service. Actual tests in competition with other makes decided this firm in favor of Lippard-Stewarts.

Radiator at Dash Our Dealers' Sign

Lippard-Stewart MOTOR TRUCKS

½ Ton, ¾ Ton, 1 Ton, 1½ Ton, 2 Ton

A Size for Different Requirements Makes the Best Line for a Good Dealer

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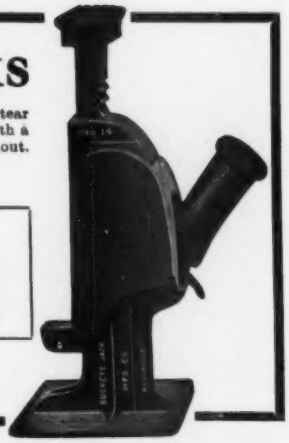
Lippard-Stewart Motor Car Company
237 W. Utica Street Buffalo, N. Y.

BUCKEYE Motor Truck Jacks



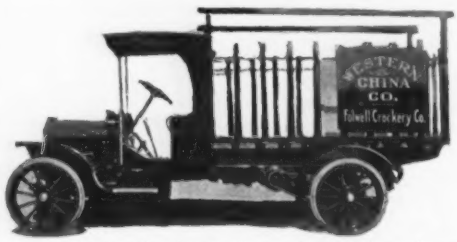
Buckeye Motor Truck Jacks are safe, reliable and made to stand the wear and tear for which they are intended. They are fully guaranteed, and cannot possibly drop with a load. They are made from Steel Drop Forgings, best finish and workmanship throughout.

Get our prices before you place your orders for jacks, we can save you money.

No.	Height Bar Down	Raise of Bar	Height Bar Up	Weight	Capacity		List Price
7	11¼″	6¼″	18″	16 lbs.	2½ tons	with formed handle	$10.00
13	14¾″	7½″	20½″	26½ "	3 "		15.00
14	14¾″	7½″	20½″	33 "	5 "		16.00
9	11½″	6″	17½″	10 "	1½ "		6.00

Write today for descriptive catalog. Made only by

THE BUCKEYE JACK MFG. CO., Alliance, Ohio



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THE BOWLING GREEN MOTOR CAR COMPANY

TRUCKS FOR 1915

Standardized thruout, Modern from radiator to tail lamp, built in chain and worm-drive models. Just the truck to get the business in your territory. *Live dealers should write for catalog.*

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NEVER-SKID

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PREVENTS SKIDDING *GIVES TRACTION*

Used by U. S. Government,
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NEVER-SKID MANUFACTURING COMPANY
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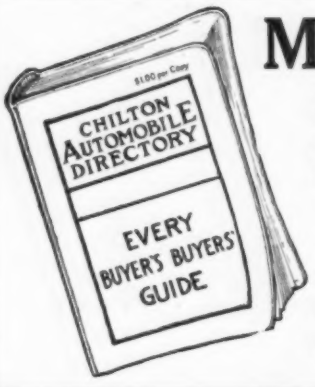

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The Pyrene Fire Extinguisher gives, not protection alone, but that which is equally important, the *constant feeling of security*. Aside from its efficiency when the fire does come, it repays its modest cost a hundred times a year in peace of mind besides securing for you *15% Reduction In Your Insurance Premium*. Ask that your new car be Pyrene equipped at the factory.

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Brass and Nickel-plated Pyrene Fire Extinguishers are included in the lists of Approved Fire Appliances issued by the National Board of Fire Underwriters examined and labeled under the direction of the Underwriters Laboratories.

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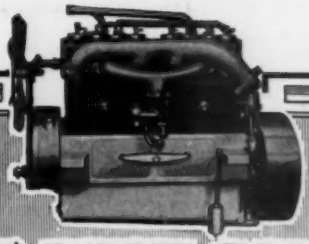

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4¼×6¼ LONG STROKE TRUCK MOTOR

EFFICIENCY is the Waukesha Motor's best eulogy. It is efficient because it is constructed to give the utmost in service.

The Waukesha crankshaft has a tensile strength of 70 tons. The bearings have three times the wearing quality of ordinary bearings. Both these metals are our own processes. The rest of the motor is on par with these two features. When we can prove all this, why not ask us to?

Why not learn that you can put a motor in your trucks that will *exceed* your broadest guarantee of efficiency, wear, and economy of fuel? Your request will bring proof that will leave no doubt of the Waukesha Long-Stroke Motor's supremacy.

WAUKESHA MOTOR CO.
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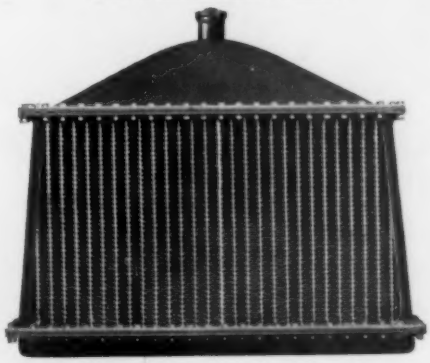
AN EXCEPTIONAL MOTOR

CANDLER TRUCK RADIATORS

Cast Demountable Tanks



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The Candler Special Truck Radiator is the strongest construction on the market to-day. It is highly adapted to truck use, by virtue of its efficiency, strength and durability, non-leakable and non-freezable features as well as its ease of repair.

We invite correspondence from those interested in a Practical and Serviceable Truck Radiator.

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Hauling Crushed Stone—

These 3½-ton Alco trucks were used by A. J. Rockwood, Adams, New York, for hauling crushed stone in road building near Adams, New York. They are completely equipped with

GOODRICH
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TRUCK TIRES

Mr. Rockwood, after changing over from other makes of tires, has found that the Goodrich Wireless is the one satifactory tire for the severe service which is demanded of a road-building truck. Under most trying conditions these tires are delivering mileages that mean money saved, for Goodrich Wireless is the tire that makes the truck effective.

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Truck buyers are specifying Long Cooling Systems and many truck manufacturers are using them as regular equipment, because they know Long Cooling Systems are the Recognized Standard and cool the motors under all conditions.

LONG COOLING SYSTEMS

differ from ordinary radiators. They are an engineering unit with the motor—designed for the particular motors with which they are to be used.

The Spiral Tube Type for heavy trucks is made with seamless tubing and perfect contacts with the ribbon wound around it. This sturdy construction is exclusive with Long. Other types are Cellular, Flat Tube, Honeycomb and Fin and Tube.

Write for catalogue describing the different types, methods of manufacture, and terms. Let us send an expert to solve your cooling problems.

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"Pioneer Makers of Gasoline Engine Cooling Systems"
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are used in every line of business and in every case have proved the most economical means of hauling.

A Rowe Truck will save you money in transporting your merchandise.

The Rowe Truck is guaranteed to give

Continuous Economical Operation

Worm or chain drive. One to five tons capacity

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GREASE AND OIL CUPS

WE MANUFACTURE
a full line of Plain, Leather Packed, Ratchet, Marine, Spring Compression, and many other styles of Grease Cups.

Our line of Oil Cups is equally satisfactory and complete.

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GUARANTEED FOR ONE YEAR

20 YEARS SUCCESS

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ON THE JOB EVERY DAY

Day in and day out the year round your truck must be ready to do its work and do it at the least possible expense.

Selden Trucks

have invariably given this kind of daily service to their owners because they are built to stand the strain of continuous work. Every working part to the last bolt is larger and stronger than corresponding parts of any other 3000-lb. truck. We invite comparison.

$500 Puts the $2000 Selden Truck into Service

The balance may be paid at the rate of $125 per month. The Selden Sales Plan as indicated above has proven very satisfactory to users and dealers alike. It will pay you to investigate the true merit of the Selden Truck and the plan by which it is sold.

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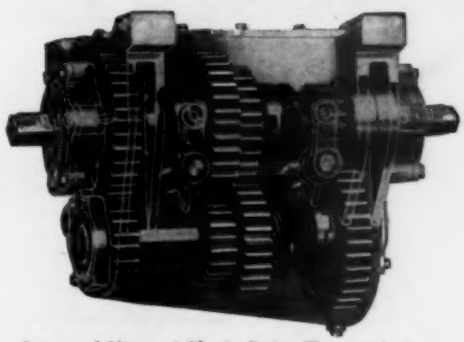

Internal View of Shaft-Drive Transmission, designed for use in worm-drive trucks

For Heavy Truck and Tractor Service

Eliminate Transmission Trouble

Selective type, individual clutch system. All gears always in mesh. Countershaft and mainshaft gears idle on direct. Improved speed-changing device. No plain bearings—loose gears mounted on roller bearings.

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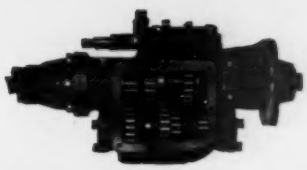
TRANSMISSIONS



Of the Highest Quality

Covert Transmissions are the result of many years' successful transmission building—today they are recognized as the best—not only in point of service and durability but also in regard to quietness and all-around efficiency.

Made in various models for different sizes and types of cars—Covert Transmissions will free you from transmission troubles. Let us show you how they fit your construction.

Covert Motor Vehicle Co.

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WHERE there is a business of any kind worthy of the name—there is a business needing in its service an International Motor Truck. So long as its management manages without an International so long is possible saving and profit going to waste.

There are far more International Motor Trucks in use, in over one hundred lines of business, than trucks of any other make. Yet in no capacity are they proving more gratifyingly successful than in general light hauling and making quick trips for moderate-sized firms.

THE INTERNATIONAL MOTOR TRUCK

in eight years of hard use has proved the superiority of its design and construction. Study its solid puncture-proof tires; the simplicity and accessibility of its powerful motor; its single-lever control; its wheels, high enough to insure good traction. You will find best material and best workmanship throughout. All these things have made this the most used of trucks. If good service, economy, and satisfaction appeal to you, you will be interested in catalogues and full information on the International Motor Truck. Write the address below.

International Harvester Company of America
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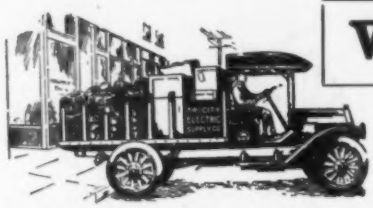
Experienced buyers of motor trucks now choose between four great makes. Each of the four is backed by millions. All are in the business to stay. Among them competition is keen. Almost daily, keenly competitive tests between these four great makes of trucks are establishing which is the best. For all are in use by the largest corporations—who use trucks by the dozen.

In pulling power the Velie Truck, the only one of the big four unadvertised until now, proves that a more powerful, slower running motor will in competitive tests out-pull and out-wear all high-speed, small-powered motors.

In three-ton trucks all four makes have 5 or 6 inch frames—channel shaped, or I-beam. But the Velie in addition to having a 6-inch I-beam frame has a 4-inch sub-frame. And in heavy hauling this extra sub-frame proves its wonderful worth.

Experienced buyers can tell by comparison of specifications why it is that the Velie is winning the fiercely competitive tests between the four best makes of trucks.

Any Velie agent has these truck contest results on file—they are convincing—ask to see them.



Velie

Velie Motor Vehicle Company - Moline, Ill.

PREVENTS NOISY GEARS

ELIMINATES LEAKY GEAR CASES

THE WORD FOR MOTOR TRUCK GEAR LUBRICATION
SPEDOLENE
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Is Revolutionizing Motor Truck Gear Lubrication

Where the pressure on axles and bearings is greatest—as with heavy pleasure cars and loaded trucks—the superiority of **SPEDOLENE** is best demonstrated. This wonderful gearing lubricant accomplishes what no other oil, grease or compound has ever been able to do.

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Remember, **SPEDOLENE** is purely a mineral lubricant and does not contain any grease, fat, lye, soda, acid or water, or anything injurious to the finest metal.

GRADE "SS" for gears in heavy pleasure cars and motor trucks.
GRADE "S" for gears in automobiles.

SOLD BY LEADING DEALERS EVERYWHERE

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Manufacturers of Asbestos Lubricants, etc.; Spedolene, Journolene, Asbestolene, Cupolene, Axolene and Gearolene
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STEERING and DIFFERENTIAL
GEARS

are standard on good motor truck construction

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Gasoline and Oil

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5 Ton Royal

Inspection of Records show ***every Royal in New York*** is selected for heavy duty, long runs and prompt deliveries.

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The phosphor bronze coupler that seals the opening

BURD
PISTON RINGS

fit with a light, firm contact that is tight and carbon-proof at every point. They have proved their merit under every sort of condition. Try them. The results will surprise you. Write for free booklet

"Power", "Miles per Gallon" and "Piston Rings"

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There's no leak proof ring but the LEAK-PROOF Ring — insist

Power Losses *vs.* Economy

It requires no argument to prove that a truck whose engine is continuously losing power cannot be economically operated. Yet many truck owners who would say this fact is self-evident are permitting a daily power loss in their engines without endeavoring to stop it.

This would seem unbelievable if it were not true, yet the slightest investigation will show that thousands of truck owners are suffering power losses by using faulty piston rings, when they could stop them, simply by adopting

Piston Rings

MADE BY McQUAY-NORRIS MFG. CO.

These men are deliberately throwing money away, and preventing their trucks from giving the maximum of service and profit by neglecting to stop these losses.

It's perfectly evident that a ring with an unprotected opening and imperfect bearing on the cylinder walls is bound to let gas escape.

It's equally evident that if such opening is sealed and perfect bearing is afforded, this leakage cannot take place.

The first is the operation of a one-piece ring; the second that of a LEAK-PROOF Ring. There can be no question as to which is best; which permits power losses; which promotes economy. Every consideration demands that you use LEAK-PROOF PISTON RINGS. Be sure, however, that the rings you buy are the genuine LEAK-PROOF and bear the trade-mark as shown above.

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In use on over 200,000 automobiles and motor boats.

Sold by all up-to-date garages, repair shops and marine stores.

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CANADA, W. H. Banfield & Sons, 120 Adelaide St., W., Toronto.

1-A

Look for the name LEAK-PROOF stamped on the Ring

Sell This Line of KREBS TRUCKS

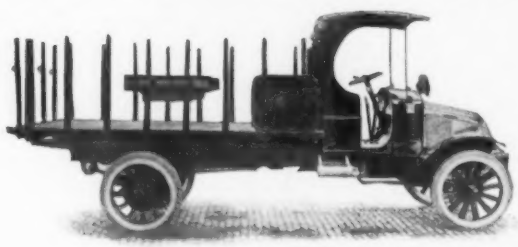
It is an easy and profitable line to sell, because the trucks have

Model E, ½-Ton Truck

Our Remarkable Automatic Governor

Krebs Model G, 1-Ton

Timken-David Brown Worm Drive



Model H, 2-Ton Truck

High-Grade Constructional Units

The Krebs line offers advantages which are not found in any other truck. They are economical, powerful, durable, efficient, and are highly successful wherever used. Let us show you why you should sell the Krebs.

The Krebs Commercial Car Co.
Clyde, Ohio

Wisconsin

CONSISTENT

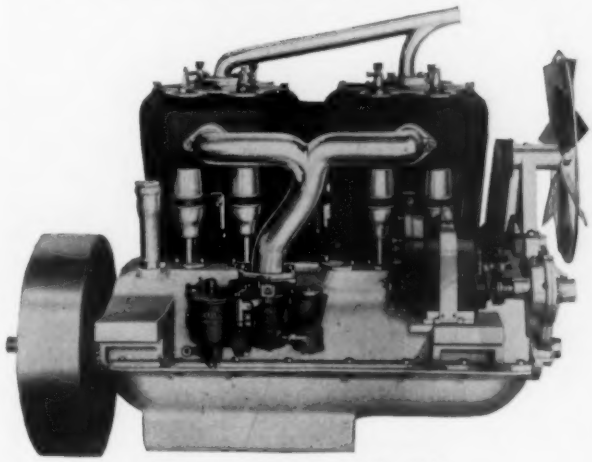
MOTORS

No type of motor, **unless specially built,** can withstand the continuous and grueling service of the motor truck.

The commercial car is at work **all** the time—in many cases day and night—and must, therefore, have a **consistent, dependable** and **durable** power plant.

The **Wisconsin** is specially **designed** and **built** for **motor truck service**—and judging from its continued popularity and ever-increasing demand by truck makers, users and dealers, it may be justly termed—

"The Consistent Truck Motor"



Wisconsin Type A—4¾" x 5½"

We invite inquiries from truck and tractor makers, who require the utmost in power and who build a truck in which is embodied the best obtainable parts and units.

Our new factory, of steel and concrete, covers over 90,000 square feet of floor space and it is devoted exclusively to the production of **Wisconsin Motors.**

Send for catalog, illustrating and describing the most complete line of gasoline motors in America.

Wisconsin Motor Mfg. Company
Milwaukee, Wisconsin, U. S. A.

MODEL T28, 4 SPEED, 3 TON TRUCK

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WARNER TRANSMISSIONS REQUIRE NO APOLOGIES BY MOTOR TRUCK SALESMEN, INSTEAD THEY ARE A VALUABLE ASSET.

BUILT BY MEN WHO KNOW AND BACKED BY FOURTEEN YEARS OF SPECIALIZATION IN TRANSMISSION BUILDING, THEY ARE A STANDARD PRODUCT OF PROVEN WORTH AND ARE ABSOLUTELY DEPENDABLE IN ANY SERVICE.

"STANDARD FOR YEARS"

TRANSMISSIONS
STEERING GEARS
DIFFERENTIALS
CLUTCHES

"THE ORIGINAL"

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BRANCH OFFICE, FORD BUILDING
DETROIT

Adams Trucks
"Deliver the Goods"

1, 1½ and 2 TON

CONTINENTAL MOTORS EXCLUSIVELY
TIMKEN AXLES AND BEARINGS THROUGHOUT
BODIES BUILT FOR ANY TRADE

PRINTED MATTER
SENT ON REQUEST

AGENCY PROPOSITION TO RESPONSIBLE DEALERS

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FINDLAY, OHIO, U. S. A.

FIRST AMERICAN TRUCK MANUFACTURERS TO USE FRENCH TYPE HOOD, WITH RADIATOR AT REAR OF MOTOR

HESS-BRIGHT

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Ball Bearings

In every city of importance in the United States can be found an Authorized Distributor of Hess-Bright Ball Bearings. Every one of our Distributors is a Service Station.

Write us for a list of them

The Hess-Bright Mfg. Co.
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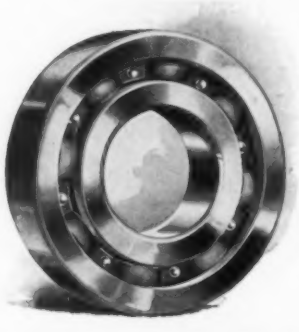

SIGNAL
MOTOR TRUCKS

3 Models
2 Lengths Wheelbase

Chain Drive—1 Ton
$1400 (Chassis)

Worm Drive—1 Ton
$1500 (Chassis)

Worm Drive—1 1-2 Ton
$1750 (Chassis)

Signal Motor Truck Co.
Detroit, Michigan

E. C. McGraw Solid Tires

Guaranteed for 10,000 Miles

Minimize Mileage Cost in Brewery Service

They are used by such prominent concerns as:

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South Side Brewing Co.
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Prompt and Efficient Service Guaranteed

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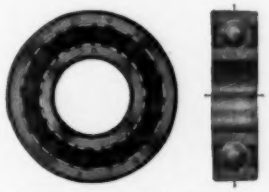
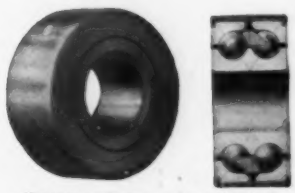
NEW DEPARTURE BALL BEARINGS

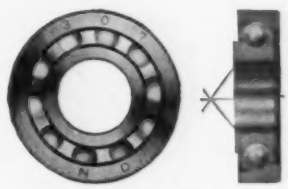
American Made for American Trade



SINGLE ROW—With improved separator, practically a full type bearing.



DOUBLE ROW—A patented bearing, taking loads from all angles.



RADAX—A high-grade cup and cone bearing, one direction thrust.

Three Distinct Types—One Quality of Material and Workmanship—A Bearing for Every Purpose

THE New Departure line of Ball Bearings is all-comprehensive, not only as to types but in respect to stock as well. This means that the American manufacturer of Motor Cars and High-grade machinery can buy right here in New England, bearings that will satisfactorily fulfill all his quality requirements, with absolute certainty of deliveries.

New Departure Ball Bearings are recognized as the Quality Bearings of the World. They have earned this recognition because of their design. Because they are made from High Carbon Alloy Steels, properly treated. They are finished to the closest possible limits and are inspected and tested most thoroughly and accurately. And because New Departure Service measures up to the size and standard of New Departure production.

With a branch house in Detroit, and with distributing depots in trade centers throughout the United States, our ability to co-operate with you is also a factor you cannot afford to ignore.

The New Departure factories if grouped in one building forty feet wide would extend a distance of over two miles. Here 2000 skilled workmen produce an average of 12,000 bearings daily—an assurance of immediate shipments.

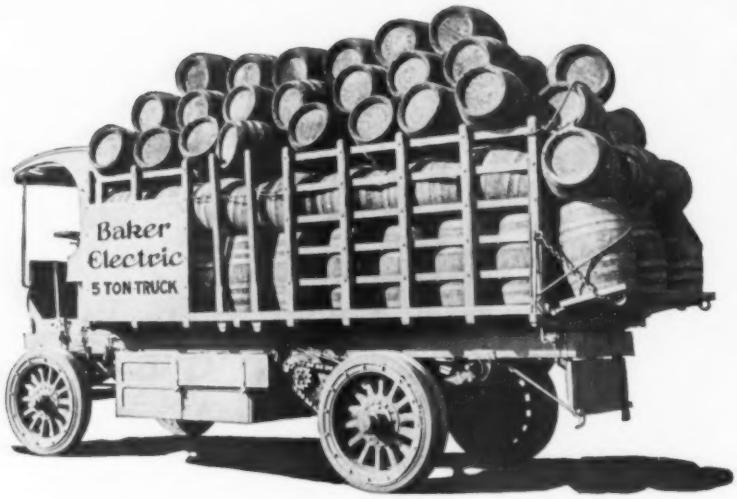
Our New Book tells the Story of the New Departure plant—It will give you new light—Send for it.

The New Departure Mfg. Co.

BRISTOL, CONN., U. S. A.

Western Branch: 1016-17 Ford Building, Detroit, Mich.

Baker Electric Trucks



Baker Electric
5 Ton Truck

For heavy duty on city streets where stops are numerous this Baker model has no equal. Here are ten of the many desirable features that characterize Baker Trucks:

1. *Low seat construction.*
2. *Controller operated from the steering post.*
3. *Easy acting steering mechanism.*
4. *Two sets of powerful double brakes.*
5. *Heavy pressed steel channel frame.*
6. *Hardened and ground pins and bronze bushings.*
7. *Every important bearing surface lubricated.*
8. *Large capacity battery—any high grade make.*
9. *Maximum speed and mileage.*
10. *Exceptionally long life and low operating cost.*

We are prepared to make early delivery on trucks of any body type in 1 ton, 2 ton, 3½ ton and 5 ton capacities. We can show you point for point why Baker Trucks cost a little more to begin with and a whole lot less in the end. A letter from you will bring this information.

The Baker Motor Vehicle Co., Cleveland

E. E. GERLINGER, V. P. & S. M.
GERLINGER MOTOR CAR CO.
PORTLAND, ORE.

Federal Dealers all over the country are unanimous in their appreciation of the service-giving and selling qualities of Federal Motor Trucks.

They realize that Federalized Transportation is the kind of haulage that their customers demand from motor trucks.

Sales volume and use-service are two vital points that are assured to a dealer in handling the Federal.

Give this your careful consideration and let us hear from you about your territory.

Federal one and one-half ton trucks

Worm and chain drive—two lengths of wheel base

FEDERAL
MOTOR TRUCK COMPANY
112-120 LEAVITT STREET
DETROIT, MICHIGAN

—Another FEDERAL Endorsement

E. E. GERLINGER, GENERAL MANAGER
CABLE ADDRESS "GEMOCACO"

Gerlinger Motor Car Co.

DISTRIBUTORS OF HIGH GRADE
MOTOR CARS AND MOTOR TRUCKS

PORTLAND, OREGON U.S.A.
Sept. 22 1914

FEDERAL MOTOR TRUCK CO.
RECEIVED
SEP 23 1914
GENERAL OFFICES
DETROIT, MICH.

Federal Motor Truck Co.,
Detroit, Mich.

Gentlemen:

The Gerlinger Motor Car Company have just closed their most successful year. The amount of sales during this year amounted to $521,000.00, this being better than one half million dollars in sales. We can truthfully say that one half the business done was on Federal trucks alone.

There can be no higher recommendation given by the Federal truck Owners as to its economy and durability than their repeat orders, which substantiates this fact.

From a dealer's standpoint we find the Federal line from the service end, the most economical, and the dealer can figure that his profits will not be impaired to any extent in rendering service.

We do not believe the truck in itself can be perfected to give better service, and knowing the abuses and over loading the trucks have been put to, it is astonishing the way they stand up.

From a selling standpoint it cannot be equalled.

Yours very truly.

GERLINGER MOTOR CAR CO.

E. E. Gerlinger.
Mgr.

DENBY

E. A. ROSS
Denbyman
(Syracuse-Buick Sales Co.
Syracuse, N. Y.)

Picking a Winner

From the Dealer's Point of View

E. A. Ross, of the Syracuse-Buick Sales Company, Syracuse, New York, knows trucks, he knows the truck business, and he understands haulage conditions thoroughly.

Here are the things that Mr. Ross says influenced him in deciding to handle Denby trucks in his territory:

"FIRST: Here was a concern with the right selling idea—not to load up the dealer, with no plan to help him sell his trucks, but to sell THROUGH the dealer to the user. The Denby Company takes a part in every sale the dealer makes. It sees to it that every truck is put into profitable use. It watches carefully for ways to further the success of both dealer and user. This attitude on the part of the manufacturer means profits to all.

"SECOND: The Denby truck is thoroughly sound and reliable. With the idea of selling real service—not features or specifications—the Denby engineers have built the kind of truck that long experience showed them to be best suited for strenuous, exacting haulage work under all conditions.

"THIRD: The investigation work of the Denby transportation experts appealed to me strongly. To have facts and figures on delivery work in all lines of business, to KNOW HOW you can save a man money with a truck, to be able to put a truck to work properly, that is the selling ammunition that brings results. Denby advertising and direct literature talk facts, not generalities, and show actual results, not probable benefits.

"FOURTH: The financial strength and business permanency of the Denby are unquestioned.

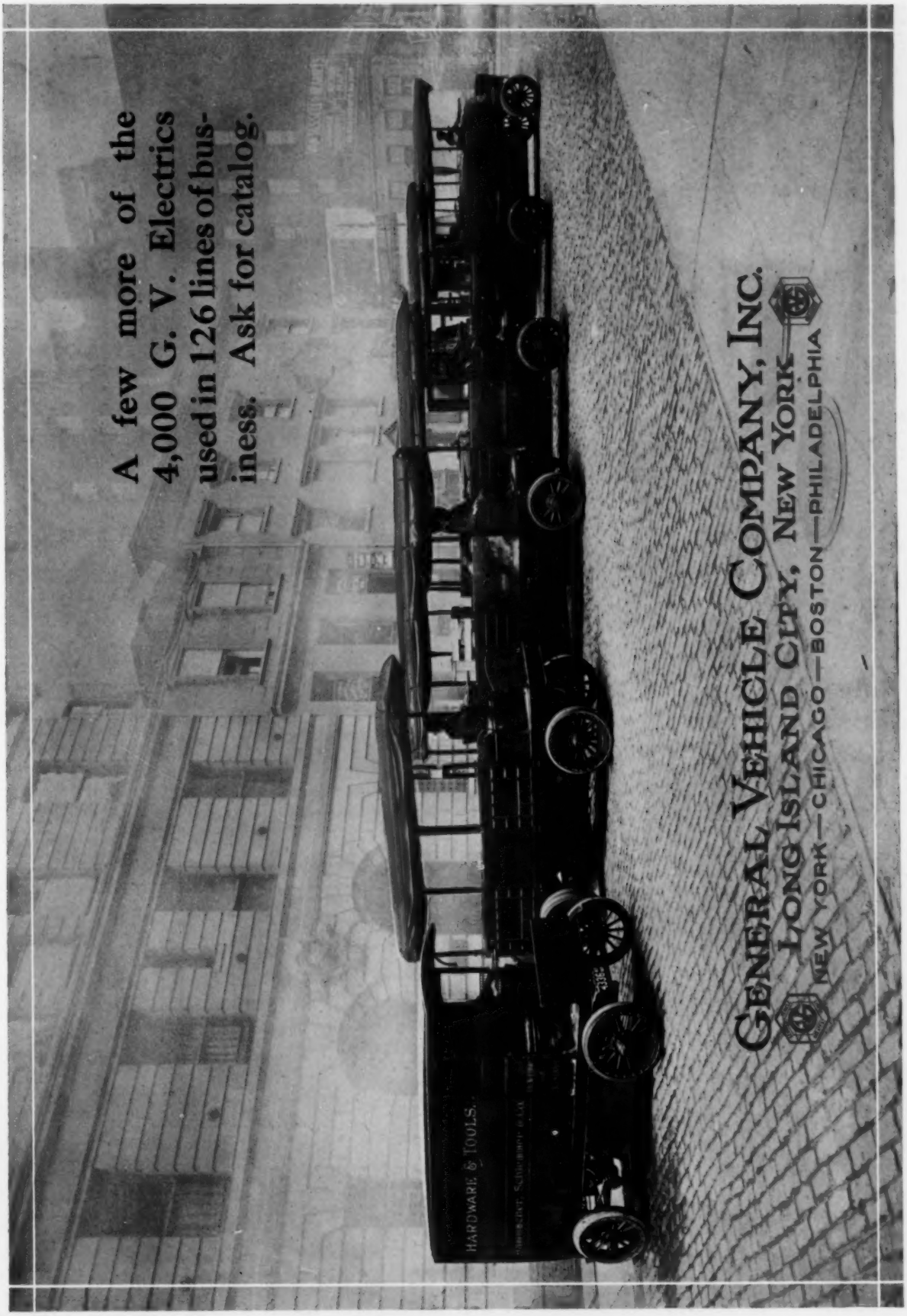
"I believe that I can make good money on Denby trucks in MY TERRITORY."

Let us tell you more in detail of the things that are making the strongest dealers in the country take on the Denby. We have a splendid proposition for aggressive dealers everywhere. Write us today for further information.

DENBY **DETROIT**

GARVIN DENBY
President
Denby Motor Truck Co.

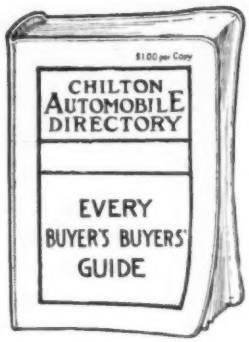
DENBY


A few more of the 4,000 G. V. Electrics used in 126 lines of business. Ask for catalog.
GENERAL VEHICLE COMPANY, INC.
LONG ISLAND CITY, NEW YORK
NEW YORK—CHICAGO—BOSTON—PHILADELPHIA
HARDWARE & TOOLS.

Order Now!

The 1915 Chilton Automobile Directory

$1.00 a Copy



Will be ready for distribution January 15th.

Every Manufacturer, Jobber, Dealer, Engineer and Purchasing Agent needs this "Directory" for daily reference.

It contains the correct name and address of every Manufacturer and National Jobber making or selling anything in the Automobile Industry; also valuable Engineering data, formulae, S. A. E. standards, etc.

Bound with flexible Fabrikoid leather for easy use.

Send us your dollar. The issue will be fully described, and ***you*** need the "Directory" —so don't miss it.

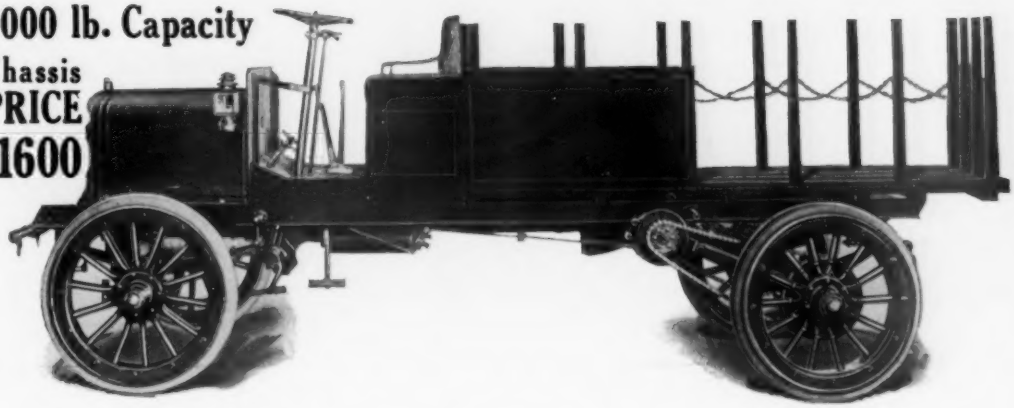
CHILTON COMPANY

Market and 49th Sts. Philadelphia, Pa.

Write Today for Our New 1915 Proposition on the

SULLIVAN MOTOR TRUCK

3000 lb. Capacity
Chassis
PRICE
$1600



It's a big business proposition for a live-wire dealer. It means many sales, large profits, and a highly successful agency.

All this is possible because the SULLIVAN is a truck that satisfies the demand of the truck buyer for efficiency, value and exceptional service-giving quality.

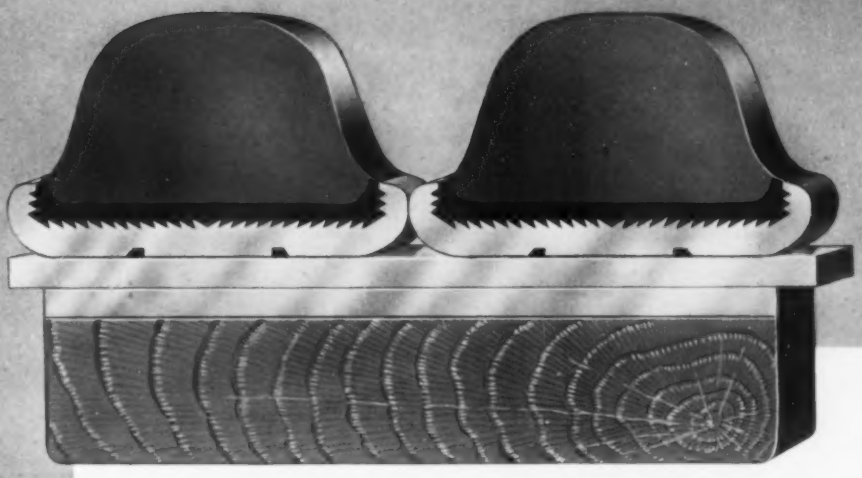
The SULLIVAN embodies standard parts and the best grade of materials and workmanship. Its design is the result of 30 years' study of transportation problems, and is one which meets the needs of the largest number of prospects.

For four years it has proved its value, efficiency and economy. These brief specifications indicate the quality of the truck:

MOTOR—Buda, 4-cylinder, vertical, cast en bloc, 3¾" x 4½".
TRANSMISSION—Covert, selective sliding gear, three speeds forward and reverse.
REAR AXLE—Drop forging, 1-⅞" x 3"; roller bearings.
BRAKES—Service on jack shaft; emergency on rear wheels.
WHEELS—Front, 14 2" spokes; rear, 14 2" spokes; best second-growth hickory.
CONTROL—Levers in center.
TREAD—56".
IGNITION—Bosch magneto.
FRONT AXLE—I-beam drop forging; roller bearing.
SPRINGS—Front, semi-elliptic; rear, half platform.
FRAME—Channel steel, 5" section.
CHAINS—Quick detachable, heavy duty.
TIRES—S. A. E Standard, 36" x 4" rear
CLUTCH—Leather-faced cone.
COOLING—Vertical tube radiator, thermo-syphon
WHEELBASE—129".
SPEED—Maximum allowed by governor, 18 miles.
EQUIPMENT—Horn, tools, three oil lamps, and driver's seat.

If you want to handle a truck that has wonderful sales possibilities, lose no time getting in touch with us regarding the SULLIVAN agency for your locality.

SULLIVAN MOTOR TRUCK CO., Rochester, New York

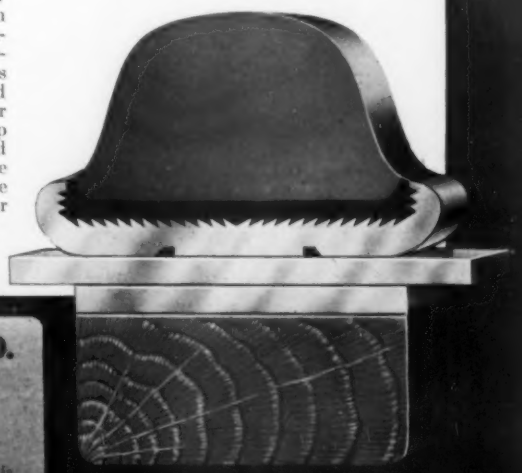


GIBNEY
PRESSED-ON
WIRELESS TIRES

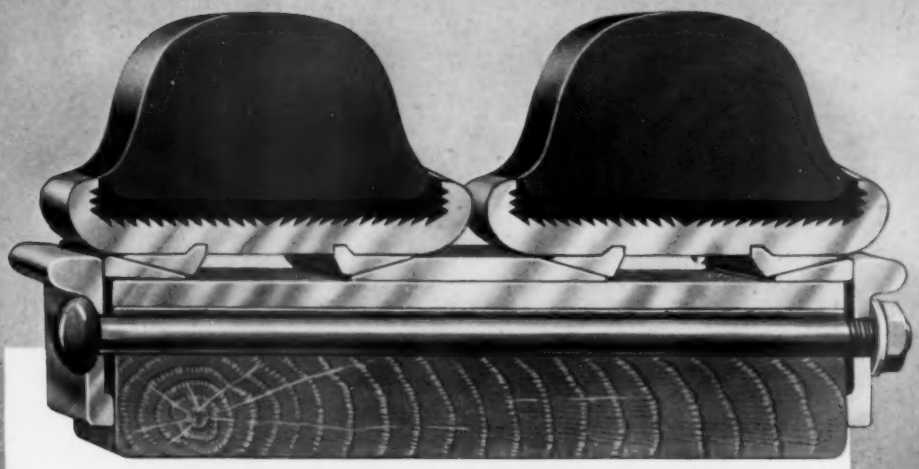
GIBNEY TIRES offer a splendid opportunity to the dealer desirous of building up a permanent and profitable agency connection. GIBNEY TIRES are rapid sellers, and a large volume of business is possible on a limited amount of capital, while our exclusive agency proposition keeps all this growing business in your hands.

GIBNEY TIRES are known from coast to coast. They are creating remarkable service records all over the country. Scores of letters from well-known users tell how they surpassed all other makes in everyday service. These letters, in their detailed statements, are powerful selling arguments.

These remarkable tires have now been made even better by certain new and distinctive features of construction. Among these is the serrated steel rim, with upturned sides to protect the junction of the hard rubber base with the soft rubber tread, the serrations continuing up the sides, firmly gripping the hard rubber. These features increase life and usefulness and help make GIBNEY TIRES the best ever placed on a truck.



GIBNEY TIRE & RUBBER CO.
Factory, Conshohocken, Pa.
BRANCHES
Philadelphia, New York, Boston, Detroit, Chicago
AGENCIES
Washington, Baltimore, Wilmington, Harrisburg, St. Louis
Cincinnati, Kansas City, Minneapolis



GIBNEY

DEMOUNTABLE WIRELESS TIRES

In addition to our standard pressed-on type, we are now offering the same tire with demountable rims, as shown above.

The construction of this tire is identically the same as that described on the opposite page—the method of application alone being different. To remove, unscrew the nut, remove side flange and wedge bands, and the tire easily slips off the wheel.

Like the pressed-on tire, this is made in both single and dual types.

Truck users should see both these new types at our branches and agencies.

Tire dealers, in localities where we are not represented, should write without delay for the best tire proposition ever offered the trade.

GIBNEY TIRE & RUBBER CO.
Factory, Conshohocken, Pa.
BRANCHES
Philadelphia, New York, Boston, Detroit, Chicago
AGENCIES
Washington, Baltimore, Wilmington, Harrisburg, St. Louis
Cincinnati, Kansas City, Minneapolis

Stewart
Delivery Trucks

USED IN 120 CITIES---85 LINES OF TRADE

Stewarts are in daily use in over 120 cities in more than 85 lines of business in the United States, Canada and South America. And *no dissatisfied owners*. Half of our business is coming from corporations and concerns who have grown motor-wise on other delivery trucks.

LOWEST OPERATING COST

A Stewart costs less to operate the year around than any other delivery truck. This statement is based on actual experience of large corporations having many delivery trucks of various makes. Our sale of repair parts last year averaged but **$1.37** per truck.

A fleet of six Stewarts owned by the Buffalo Evening News, Buffalo, N. Y., averaged 11,257 miles each, last year. The average cost for gasoline, tires, repairs, oil and grease was but **$1.33** per day, per truck. And this is the record of hundreds of other Stewarts.

SOME FREQUENT REPEATERS AND USERS OF 2 TO 19 EACH

Bell Telephone Co.	New York, N. Y.	Emerson Bros.	Brattleboro, Vt.
Wagner Pastry Co.	Newark, N. J.	South Park Commission	Chicago, Ill.
Buffalo Evening News	Buffalo, N. Y.	Diamond Laundry	Los Angeles, Cal.
Iroquois Natural Gas Co.	Buffalo, N. Y.	Peerless Laundry	Los Angeles, Cal.
Buffalo Times	Buffalo, N. Y.	I. Magnin & Co.	San Fran., Cal.
Taylor Ice Cream Co.	Buffalo, N. Y.	Wardell Steam Laundry	Newark, N. J.
Gerhard Lang	Buffalo, N. Y.	S. & Z. Dyeing & Cleaning Co.	Hoboken, N. J.
The Delivery Co.	Buffalo, N. Y.	Genesee Pure Food Co.	LeRoy, N. Y.
Montreal News Co.	Montreal, Canada	So. New England Tel. Co.	Bridgeport, Conn.
Monahan Express Co.	New York, N. Y.	Iten Biscuit Co.	Omaha, Neb.
Bonwit-Teller & Co.	New York, N. Y.	Newark Water Department	Newark, N. J.
Rice & Kelly	Pittsfield, Mass.	Providence Gas Co.	Providence, R. I.
Hudner Markets, Inc.	Fall River, Mass.	C. F. Hathaway & Son.	Cambridge, Mass.
R. A. McWhirr Co.	Fall River, Mass.	And many others	

EXPERTS RECOMMEND THEM

Engineers and Automobile men will tell you that the mechanical parts used in the Stewart are the best known to the automobile industry. Nothing better can be purchased. These mechanical parts coupled with our design and construction is the reason for the great success of the Stewart.

Catalog and Booklet "How Motor Delivery Pays" free upon request.

GENERAL SPECIFICATIONS

Continental Motor, Horsepower 30
Zenith Carburetor, no adjustments
Fedders Honeycomb Radiator
Brown-Lipe, Selective Type Transmission
Multiple Disc, Dry Plate Clutch
Timken Axles, Front and Rear
Timken Roller Bearings throughout
Firestone Demountable Rims
Wheelbase 126" regular, 135" special
Capacity 1500 pounds
Any Type Body

STEWART MOTOR CORPORATION
Jefferson, Superior and Randall Streets - BUFFALO, N. Y.

Advertisers' Index

Adams Bros. Co. 84
American Taximeter Co. 57
Autocar Co. 2

Baker Motor Vehicle Co. ... 86
Bessemer Motor Truck Co. .. 75
Bowen Mfg. Co. 78
Bowling Green Motor Truck Co. 76
Bowser, S. F. & Co., Inc. ... 79
Buchanan Electric Steel Co. . 64
Buckeye Jack Mfg. Co. 76
Buda Co. 69
Burd High-Compression Ring Co. 81

Candler Radiator Co. 77
Childs, O. J., Co. 75
Chilton Co. 90
Cleveland Worm & Gear Co. 53, 68
Commerce Motor Car Co. ... 73
Continental Asbestos Corp. .. 80
Cotta Transmission Co. 79
Covert Motor Vehicle Co. ... 79
Cramp, Wm. & Sons, S. & E. Bldg. Co. 73
Cullman Wheel Co. 70

Denby Motor Truck Co. 88
Durant-Dort Carriage Co. Flint Motor Wagon Dept. 59

Edison Storage Battery Co. .. 65
Eisemann Magneto Co. 95
Electric Storage Battery Co. . 73

Federal Motor Truck Co. ... 87
Firestone Tire & Rubber Co. . 45

General Motors Truck Co. .. 63
General Vehicle Co., Inc. 89
Gibney Tire & Rubber Co. 92, 93
Goodrich, B. F., Co. 77
Goodyear Tire & Rubber Co. 55
Gould Storage Battery Co. .. 71
Gramm-Bernstein Co. 72

Herz & Co. 79
Hess-Bright Mfg Co. 84
Highland Body Mfg. Co. 58

Independent Motors Co. 56
International Harvester Co., of America 80

Jeffery, Thomas B., Co. 54
Johns-Manville, H. W., Co. .. 62

Koehler, H. J., S. G. Co. 95
Krebs Commercial Car Co. ... 82

Lavigne Gear Co. 74
Lippard-Stewart Motor Car Co. 75
Long Mfg. Co. 78

McGraw Tire & Rubber Co. 84
McQuay-Norris Mfg. Co. 82

Never-Skid Mfg. Co. 76
New Departure Mfg. Co. 85

Packard Motor Car Co. 96
Parish & Bingham Co. 73
Pierce-Arrow Motor Car Co. . 67
Pierce Speed Controller Co. Inside Back Cover
Polack Tyre & Rubber Co. Back Cover
Pyrene Mfg. Co. 77

Republic Motor Truck Co. Front Cover
Ross Gear & Tool Co. 80
Rowe Motor Mfg. Co. 78
Royal Motor Truck Co. 81
Russel Motor Axle Co. 66
Rutenber Motor Co. 72

Schwarz Wheel Co. 61
Selden Truck Sales Co. 79
Sheldon Axle & Spring Co. .. 60
Signal Motor Truck Co. 84
Speedograph Sales Corp. 69
Spicer Mfg. Co. 78
Splitdorf Electrical Co. 74
Stegeman Motor Car Co. 74
Stewart Motor Corporation 75, 94
Sullivan Motor Truck Co. 91

Thermoid Rubber Co. 71
Touraine Co. 74

United States Tire Co. 72

Van Dorn & Dutton Co. 72
Veeder Mfg. Co. 68
Velie Motor Vehicle Co. 80

Warner Gear Co. 83
Waukesha Motor Co. 77
West Steel Casting Co. Inside Front Cover
White Co. 47
Wisconsin Motor Mfg. Co. ... 83

EISEMANN

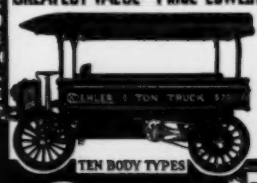
The most simple—the most accessible—the most durable—the most efficient magneto ever produced is the new Type G-4.

The Eisemann Magneto Company
Sales and General Offices,
32 33d St., Brooklyn, N. Y.
New York, N. Y. 123 W. 52d St. Indianapolis, Ind 514 North Capitol Ave. Detroit, Mich. 802 Woodward Ave.

DEALERS: OUR AGENTS ARE MAKING MONEY!

KOEHLER ONE TON TRUCK $750

GREATEST VALUE = PRICE · LOWEST PRICE = CAPACITY



Here are brief specifications: MOTOR, 24 h.p., water-cooled, 4-cycle; IGNITION, high-tension magneto; TIRES, 36-inch, standard removable; TREAD, 58 inches; AXLES, 2-inch square rear, 1½ inch front; TRANSMISSION, proved RIGHT by years of use. Gears, genuine chrome-nickel.

TEN BODY TYPES

KOEHLER $750 ONE TON TRUCK

THE REASON

SEND FOR CATALOGUE

DEALERS How about your city or town—is it Koehlerized, or waiting for someone to reap a harvest from sales? Will it be you, or one of your competitors who will make it hard for anyone else to sell any other make of truck? The Koehler is a great money-maker for dealers, being the lowest priced ton truck and giving greatest value at any price.

OUR TRAVELING REPRESENTATIVES ARE NOW COVERING THE ENTIRE COUNTRY and each has a truck with him. Notify us at once if you are interested as a representative may now be in your section. You do not want to miss a chance to see this truck.

Our complete catalog and selling plan should be in your hands—send for these.

H. J. KOEHLER S. G. CO., 1700 Broadway, New York

KOEHLER ONE TON TRUCK $750

WILL YOU LET US GIVE YOU THE PROOF? DEALERS

BREWERS PREFER THE Packard

ASK THE MAN WHO OWNS ONE

BREWERS have done more, perhaps, to commercialize the motor truck than any other single group of business men. The motor truck is especially well adapted to the needs of the brewery business.

Packard trucks are selected most often because brewery transportation demands a factor of safety that is ample to meet emergency requirements.

Brewers were quick to learn that stability is inherent in the Packard truck as well as in the company that stands back of it.

The Packard reduces the cost of transportation to a minimum and insures deliveries on schedule regardless of road conditions.

This letter accompanied an order for two additional Packard trucks:

Gentlemen:

We wish to say that we can not express ourselves too strongly in favor of the Packard truck. We use five trucks in our business, one of them being a Packard, and our great regret is that we are not fortunate enough to have them all Packards.

From our experience the Packard is in a class by itself for economy and efficiency. We can speak from experience and are confident that one will never regret having bought a Packard.

Very truly yours,
SAN DIEGO BREWING CO.
Signed: J. H. Zitt, Pres.
San Diego, California

ONE HUNDRED AND FORTY-TWO SUCCESSFUL BREWERS ARE OPERATING MORE THAN 300 PACKARD TRUCKS IN 71 CITIES

PACKARD MOTOR CAR COMPANY
DETROIT

MADE IN AMERICA

"Famous Pierce Products"

These firms use the Famous Pierce Governors because they are better

PARTIAL LIST OF USERS

Atterbury Motor Car Co., Buffalo, N. Y.
Adams Bros. Co., Findlay, O.
American Express Co., New York.
Autocar Co., Ardmore, Pa.
American Glycerine Co., Bartlesville, Okla.

Buckeye Mfg. Co., Anderson, Ind.
Bowling Green Motor Car Co., Bowling Green, O.
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Brockway Motor Truck Co., Cortland, N. Y.
Buffalo Enquirer, Buffalo, N. Y.
Busy Bee Motor Car Co., St. Louis, Mo.
Brewster & Co., Long Island City, N. Y.
Boston Fire Dept., Boston, Mass.
Borg & Wharry Motor Car Co., St. Paul, Minn.
Bessemer Motor Truck Co., Grove City, Pa.

Continental Motor Mfg. Co., Detroit, Mich
Corbitt Auto Co., Henderson, N. C
City of Los Angeles, Los Angeles, Cal.
Chase Motor Truck Co., Syracuse, N. Y.
Croce Auto Co., Inc., Ashbury Park, N. J.
Chicago City Ambulances.
Chicago Insurance Patrols.

Detroit-Wyandotte Motor Co., Wyandotte, Mich.
De Kalb Wagon Works, De Kalb, Ill.
Denby Motor Truck Co., Detroit, Mich.
Driggs-Seabury Ordnance Corp., Sharon, Pa.

Freeman Co., Ltd., Edmonton, Can.
Fairman Motor Implement Co., Davenport, Iowa.
Farmington Auto Co., Farmington, N. M.

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Gabriel Auto Co., Cleveland, O.
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Rowe Motor Mfg. Co., Downingtown, Pa.
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Stewart Motor Corp., Buffalo, N.Y.
Shaw Transfer Co., Kansas City, Mo.
Selden Motor Vehicle Co., Rochester, N.Y.
Signal Motor Truck Co., Detroit, Mich.
Service Motor Truck Co., Wabash, Ind.
Standard Motor Truck Co., Warren, O.
Sternberg Mfg. Co., New York, N.Y.
Southern Motor Car Co., New Orleans, La.
Sears-Roebuck, Co., Chicago, Ill.
Sandow Truck Co., Chicago, Ill.
Star Motor Delivery Co., Chicago, Ill.
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Stegeman Motor Car Co., Milwaukee, Wis.

Twin City Taxi-Cab Co., Minneapolis, Minn.

Universal Motor Truck Co., Detroit, Mich.

Von Hamm Young Co., Honolulu, T.H.
Velie Motor Vehicle Co., Moline, Ill.

Waukesha Motor Co., Waukesha, Wis.
Wisconsin Motor Mfg. Co., Milwaukee, Wis.
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Western Electric Co., Chicago, Ill.
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White Co., 6 branches

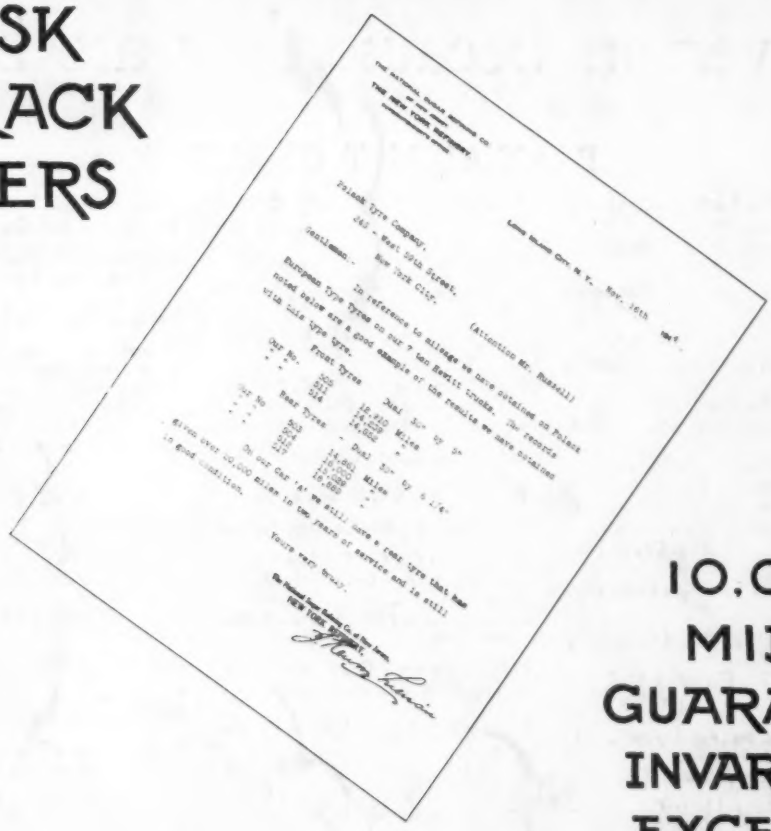
PIERCE SPEED CONTROLLER CO.

ANDERSON, IND., U. S. A.

POLACK

INSURES TRUCK SERVICE

ASK
POLACK
USERS



10,000
MILES
GUARANTEE
INVARIABLY
EXCEEDED

POLACK TYRE & RUBBER CO.

246 WEST 59TH STREET, NEW YORK.

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